

**SERVICES AND RESEARCH FOR CROP
PROTECTION AND CROP NUTRITION
SINCE 1985**



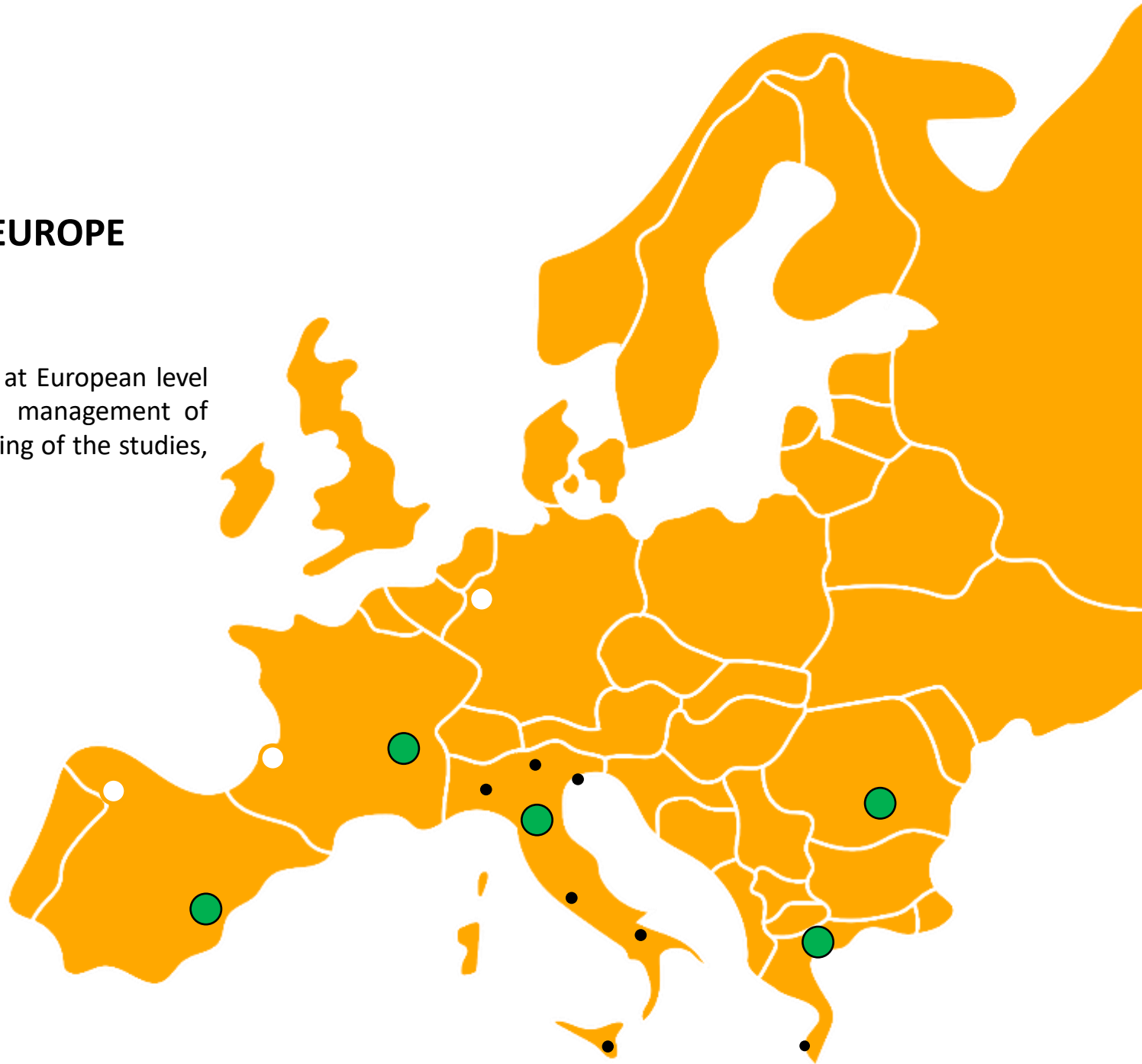
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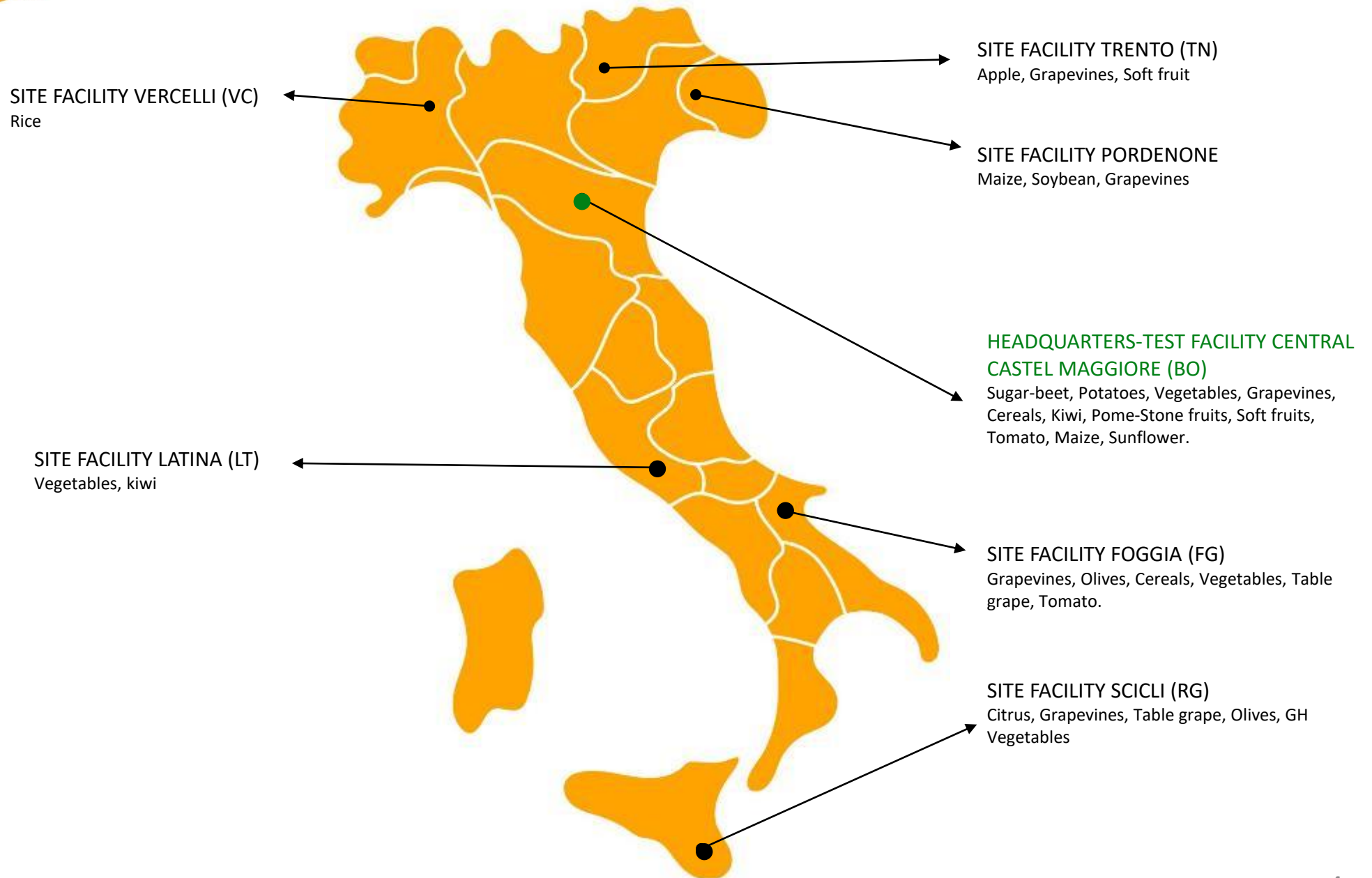
**OPERATIVE SITES IN
EUROPE
(GEP ACCREDITED)**

OPERATIVE SITES IN EUROPE

Agri Net manages GEP studies at European level (protocols writing, quotation, management of samples, field tours and reporting of the studies, BAD writing).

-  Agri 2000's Head Offices
-  Agri 2000's Site Facilities
-  Agri 2000's Partners





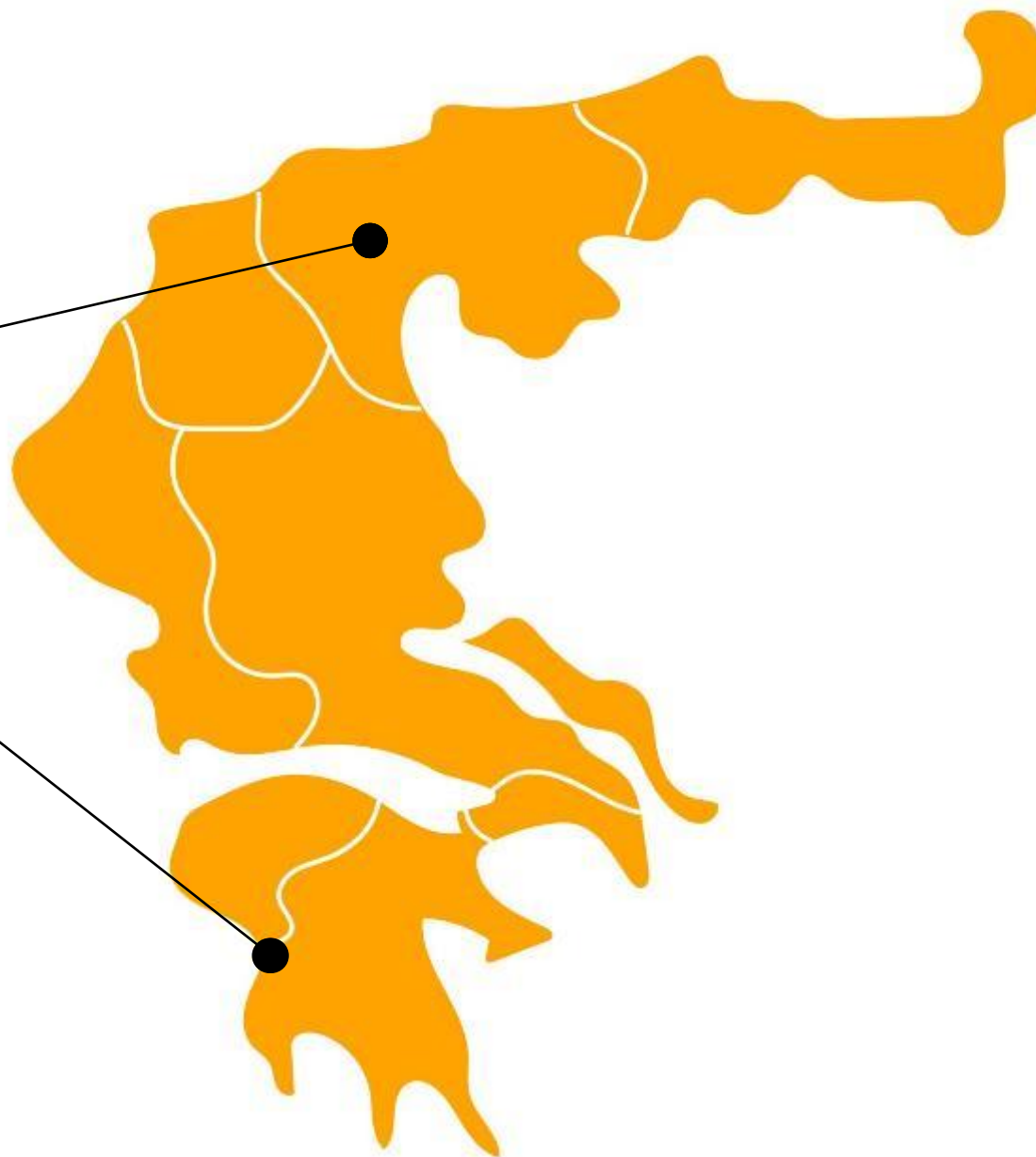
● TEST FACILITY (THESSALONIKI)

Maize, Soybean, Cereals, Tobacco,
Vegetables, Pome and Stone fruits,
Grapevines, Rice, Sunflower, Cotton

● TEST FACILITY (KIPARISSIA)

Wheat, Tobacco, Vegetables, Grapevines,
Olive, Citrus, Strawberry, Table grape.

**GEP ACCREDITATION
SINCE 2012**





**PARTNER FACILITY
(MARIN PONTEVEDRA)**

Grape, Stone Fruits (Peach, khaki), Cereals,
Pome fruits

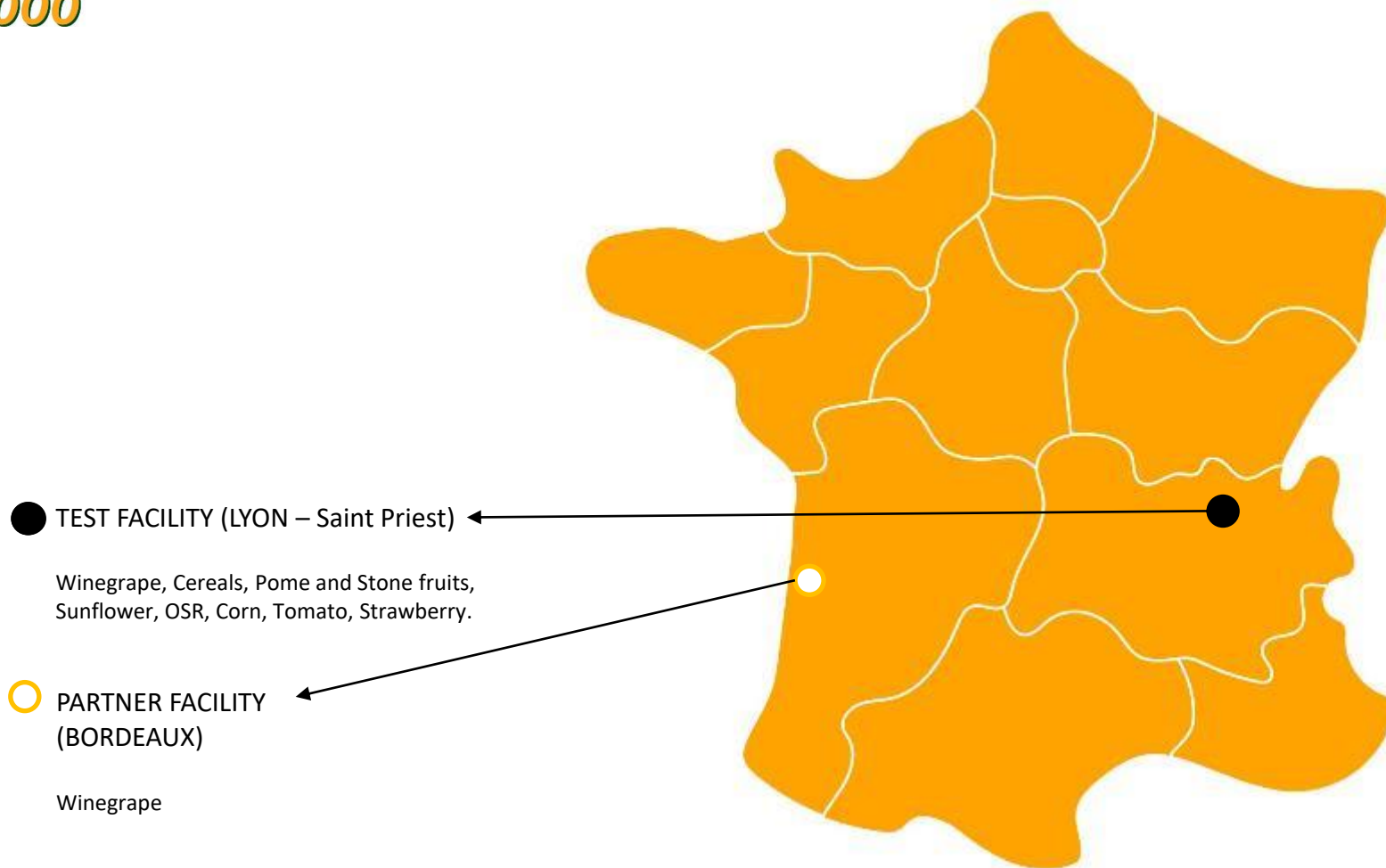


TEST FACILITY (VALENCIA)

Grape, Vegetables, Stone Fruits (Peach,
khaki) Cherry, Cereals, Sunflower, Maize,
Citrus, Olives, Table grape, Potatoes.



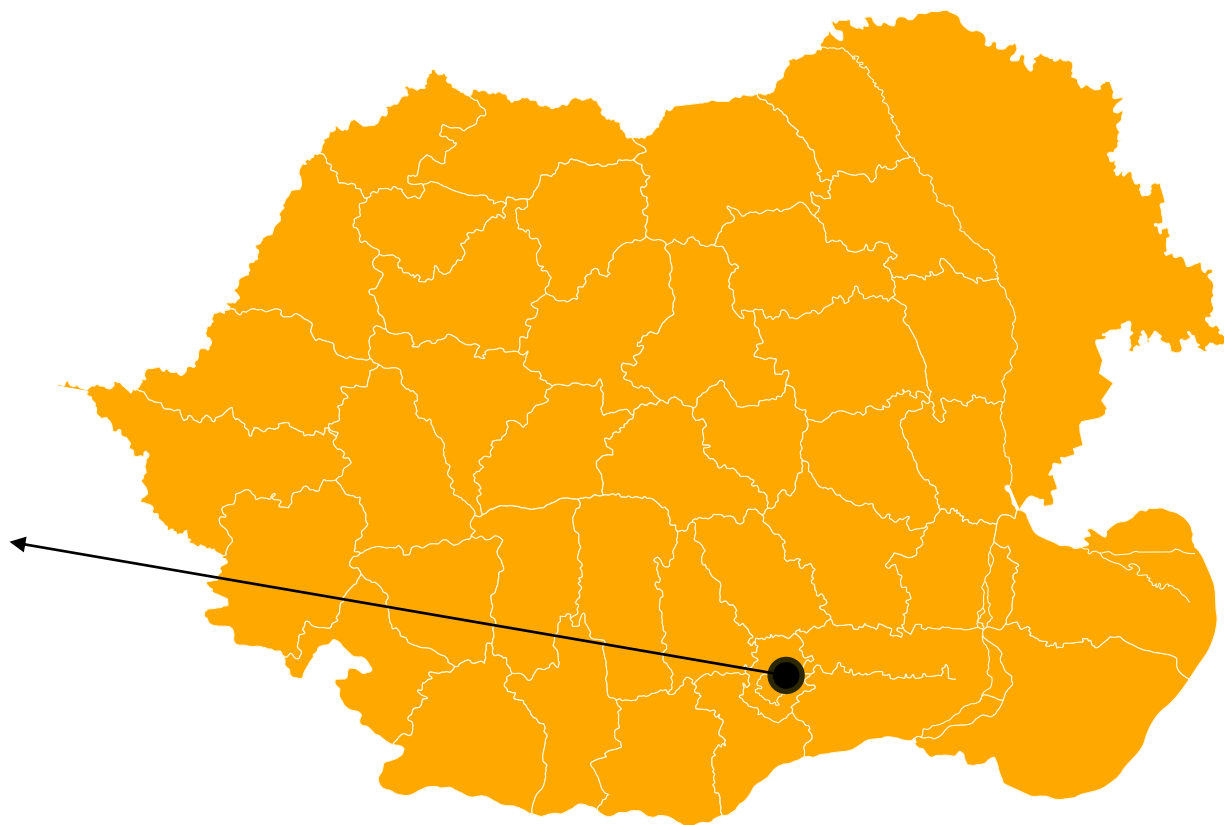
**GEP ACCREDITATION
SINCE 2016**



**GEP ACCREDITATION
SINCE 2018**

● TEST FACILITY (BUCHAREST)

Cereals, Winegrape, OSR, Maize,
Sunflower, Apple-Pear, Potato,
Vegetables



**GEP ACCREDITATION
SINCE 2023**

**CROP PROTECTION
LAB AND
SEMI-FIELD
STUDIES**

NEW RESEARCH CENTER

- 7 GROWTH CHAMBERS, INCLUDING 1 WITH CO₂ CONTROL.
- LAB FOR STUDIES ON FUNGI.
- LAB FOR STUDIES ON INSECTS.
- EQUIPMENT FOR PROCESSING STUDIES.
- SENSORY BOOTHS FOR TAINT TEST.



BIOASSAYS WITH INSECTICIDES & ACARICIDES

Currently we have established populations of:

- *Helicoverpa armigera* (cotton bollworm);
- *Spodoptera littoralis* (cotton leafworm);
- *Spodoptera exigua* (beet armyworm);
- *Halyomorpha halys* (brown stink bug);
- *Nezara viridula* (green stink bug);
- *Trichoplusia ni* (cabbage looper);
- *Tuta absoluta* (tomato leafminer);
- *Myzus persicae* (green peach aphid).



- **Type of trials:** Acute toxicity, Persistence, Rainfastness.
- **Efficacy bioassays:** direct spraying on target or food, leaf-dip, diet incorporation, topical application, spraying on whole plant/fruit and infestation.
- **Baseline/Resistance** monitoring;
- **Sublethal Effects:** adult longevity, fecundity, egg viability, nymph to adult developmental time, survival, sex ratio.
- Testing of **side effects on beneficials:**
 - *Aphidius colemani*,
 - *Chrysoperla carnea*,
 - *Coccinella septempunctata*,
 - *Adalia bipunctata*,
 - *Trissolcus japonicus*,
 - *Anastatus bifasciatus*.



BIOASSAYS WITH INSECTICIDES & ACARICIDES



BIOASSAYS WITH INSECTICIDES & ACARICIDES

	<i>Spodoptera littoralis</i>	<i>Helicoverpa armigera</i>	<i>Trichoplusia ni</i>	<i>Tuta absoluta</i>	<i>Halyomorpha halys</i>	<i>Drosophila suzukii</i>	<i>Myzus persicae</i>	<i>Bemisia tabaci</i>
Leaf/fruit dip	X	X	X	X	X	X	X	X
Leaf/fruit spraying	X	X	X	X	X	X	X	X
Diet incorporation	X	X	X					
Topical application					X			
Whole plant dip	X	X	X	X	X	X	X	X
Whole plant spraying	X	X	X	X	X	X	X	X
Soil application	X	X						
Stages	larvae (L1-L5)	larvae (L1-L5)	larvae (L1-L5)	larvae (L1-L5)	adults-eggs-nymphs	adults-larvae	adults	adults-eggs-nymphs



BIOASSAYS WITH FUNGICIDES

Agri-Net performs in-vitro and in-vivo bioassays using its own fungi isolated from tissues collected in the field.

MAIN PLANT PATHOSYSTEMS TESTED ON WHOLE PLANT

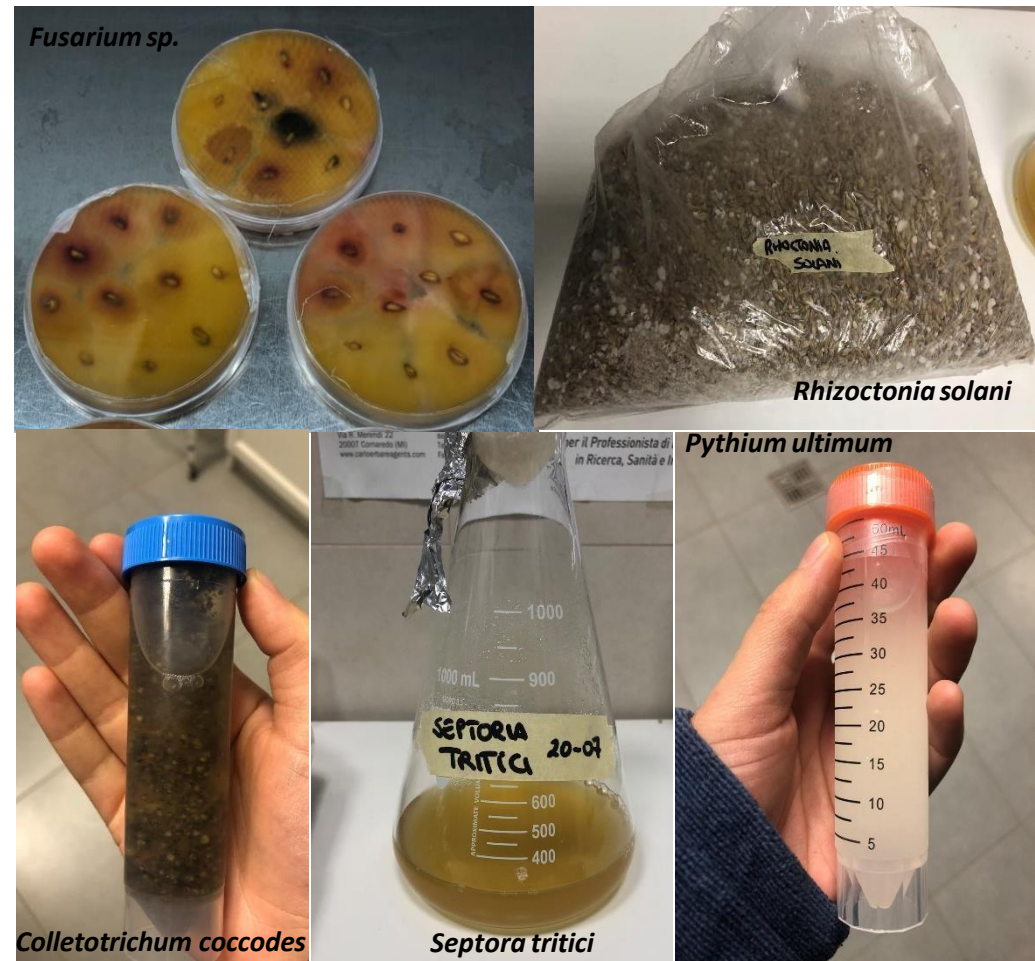
CROP	DISEASE	Whole plant in pot
Grape	<i>Botrytis cinerea</i>	X
	<i>Plasmopara viticola</i>	
	<i>Erisiphe necator</i>	
Wheat and other cereals	<i>Septoria tritici</i>	X
	<i>Fusarium</i> sp.	
	<i>Puccinia graminis</i>	
	<i>Puccinia triticina</i>	
Tomato	<i>Phytophthora infestans</i>	X
	<i>Alternaria</i> sp.	
	<i>Colletotrichum</i> sp.	
Cucurbits	<i>Pseudoperonospora cubensis</i>	X
	<i>Podosphaera xanthii</i>	
	<i>Colletotrichum</i> sp.	
	<i>Golovinomyces cichoracearum</i>	
Apple	<i>Venturia inaequalis</i>	X
Pear	<i>Stemphylium vesicarium</i>	
Strawberry	<i>Botrytis cinerea</i>	X
Lattuce	<i>Bremia lactucae</i>	X



Fungal strains collection and inoculum preparation



Fungal isolation from field samples (Italy and other European facilities), identification, characterization, conservation in our fungal collection



Preparation of liquid or solid inoculum

BIOASSAYS WITH FUNGICIDES

MAIN PLANT PATHOSYSTEMS TESTED AGAINST SEEDLING DISEASES

SOIL BORNE DISEASES	Rhizoctonia sp.	Phytophthora sp.	Fusarium sp.	Microdochium sp.	Sclerotinia sp.	Colletotrichum sp.	Phoma sp.
Sugarbeet	X	X					X
Sunflower	X	X			X		
Potato	X	X				X	
Soybean	X	X	X				
Cotton	X		X				
Wheat			X	X			
Lettuce		X	X				
Maize	X	X	X				
OSR		X					
Rice			X				
Barley				X			
Rye				X			
Triticale				X			
Spinach		X					
Tomato		X	X				
Turf	X						



BIOASSAYS WITH FUNGICIDES

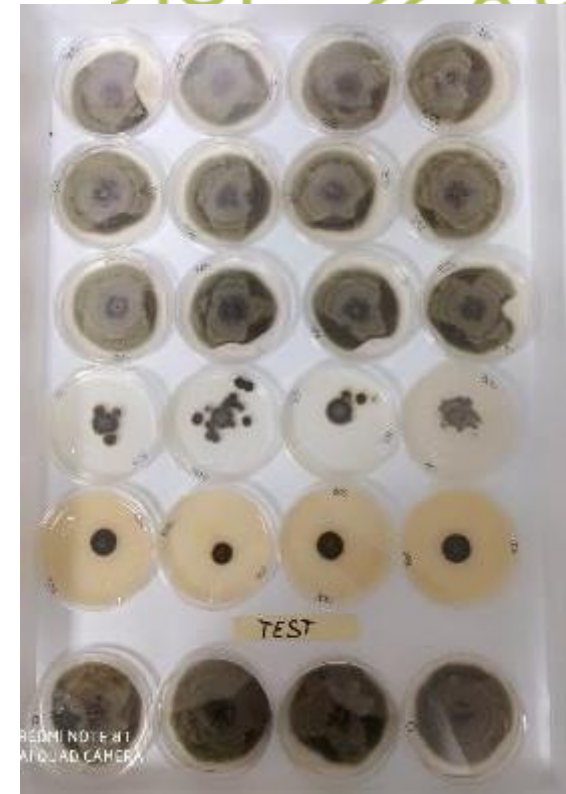
Resistance monitoring

Monitoring of pathogen resistance is an important tool for an early prediction of resistance development in field pathogen populations.

In the bioassay the mycelial growth or the conidial germination of the pathogen is evaluated on media added with fungicide at different concentrations.

Data obtained allow to calculate the EC50-EC90 value and to categorize the pathogen as sensitive or resistance.

For fungicide classes with established molecular mechanisms of resistance, molecular techniques provide information on the presence of nucleotide polymorphisms in the target gene.





BIOASSAYS WITH HERBICIDES

Agri-Net carries out trials in controlled conditions for:

- ✓ Testing the efficacy of herbicides against weeds collected directly or in collaboration with Public bodies.
- ✓ Test different active ingredient on resistant populations of weeds.
- ✓ Test selectivity on different variety of any crop.

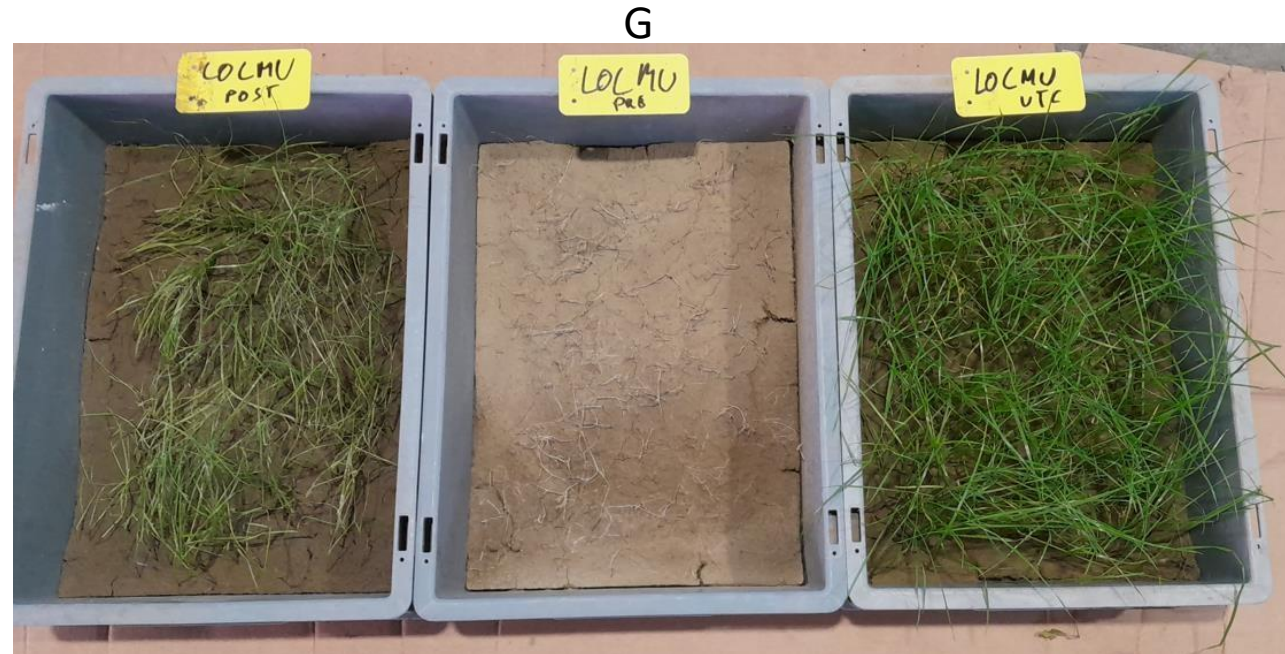


BROADLEAVES WEEDS

- ✓ *Papaver* sp.
- ✓ *Matricaria camomilla*
- ✓ *Galium aparine*
- ✓ *Stellaria media*
- ✓ *Capsella bursa-pastoris*
- ✓ *Sinapis arvensis*
- ✓ *Chenopodium album*
- ✓ *Amaranthus retroflexus*
- ✓ *Abutilon theophrasti*
- ✓ *Malva sylvestris*

GRASSES

- ✓ *Lolium* sp.
- ✓ *Poa* sp.
- ✓ *Apera spica-venti*
- ✓ *Echinochloa* sp.
- ✓ *Digitaria* sp.
- ✓ *Alopecurus myosuroides*
- ✓ *Avena* sp.
- ✓ *Phalaris* sp.



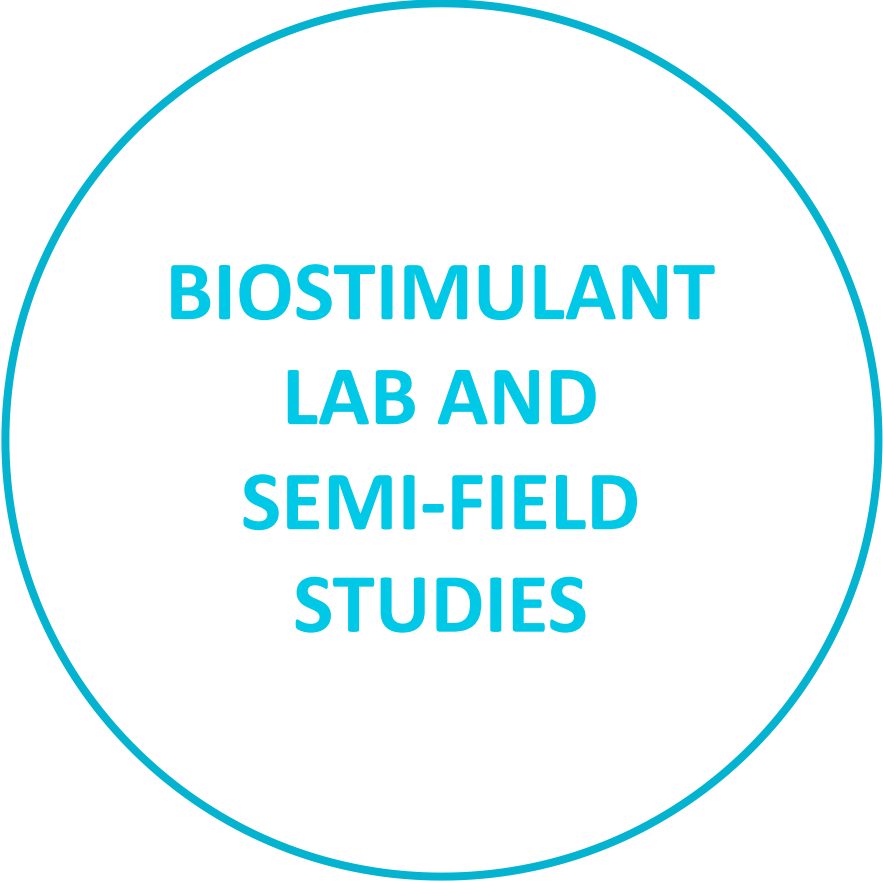


- ✓ Possibility to use artificial substrates and agricultural soil for pre-emergence trials
- ✓ Germinability test on seeds lot are carried out before start of the trial
- ✓ Possibility of working on other species in addition to the weeds present in the previous list

POST-HARVEST MANAGEMENT

- ✓ Screening of biocontrol agents against postharvest diseases
- ✓ Screening of edible coatings (EC) sourced from agricultural products
- ✓ Test of active packaging materials for extending shelf-life of fruits and vegetables





**BIOSTIMULANT
LAB AND
SEMI-FIELD
STUDIES**



BIOSTIMULANT TESTS IN GROWTH CHAMBER AND GREENHOUSE

Agri 2000 Net performs test in growth chamber to investigate the characteristics and the efficacy of the biostimulant products for development and registration purposes (Reg. EU 2019/1009).

- Screening of biological matrices candidate for biostimulant effect.
- Study of the mode of action. Collaboration with scientific institutions allows to carry out specific genomic and metabolomic studies.
- Study of the dose effect in relation to the target crop.
- For registration purposes, treatments and trial design are defined according to the CEN Technical specifications





ABIOTIC STRESS

- Test in climatic chamber to simulate different conditions: cold stress, heat stress, water stress, herbicide stress, light stress, salinity stress.
- Trials on annual and perennial crops.
- Negative control available: not stressed and untreated treatment.
- The stress level is planned according to literature studies and to the plant characteristics. It is measured with environmental sensors (termometer, humidity sensors for air and soil, luxometer, conducimeter, ecc.).
- Both phenological and physiological assessments are carried out to check the stress markers: damage visual evaluations, photosyntesis parameter measures, crop cover and Leaf Area Index, ion content in the plant sap, thermal camera, image analysis, etc.

NUTRIENT USE EFFICIENCY

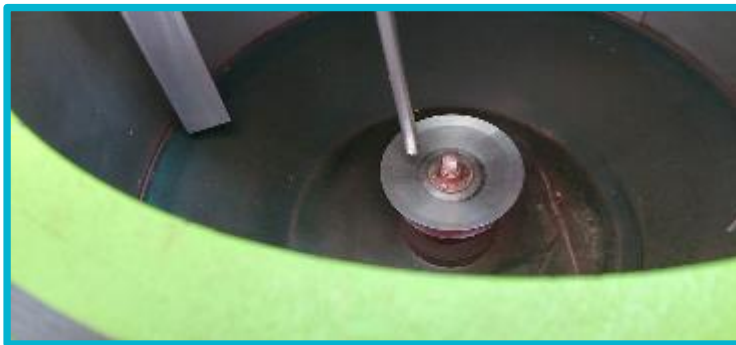
- Trials to evaluate the activation of nutrient confined in soil or to check the nutrient use efficiency.
- Trial design taking into account the nutritional content of the tested materials and the nutritional inputs of the treatments.
- Assessments on root biomass and canopy biomass.
- Nutritional analysis on different plant parts.
- Studies on the rhizosphere: enzymatic analysis and microbiological analysis.



QUALITY TRAITS

- Trial design according to the specific claimed quality traits (agronomical or marketable traits: germination rate, dry matter content, color, size, °brix, etc.)
- Definition of the suitable markers to demonstrate the product efficacy to improve the claimed traits.
- Visual and instrumental assessments on the specific markers.





SEED DRESSING TRIALS

Agri-Net carries out trials under controlled conditions and in open field for testing biostimulant seed coating formulations for their potential to increase the tolerance against different abiotic stresses and to improve nutrient and water uptake.



**FIELD
TRIALS**

FIELD TRIALS



- Efficaci Trials (GEP) on all the crops cultivated in the areas of activity
- Seed Dressing Trials
- Variety Trials
- Demo Trials, Platforms & Workshop Organization

Variety trials

- ✓ Complete management of trials (sowing, harvest, analyses...).
- ✓ Crop quality and performance: distinctness, uniformity and stability.
- ✓ Value for Cultivation and Use: susceptibility to different pests/diseases, adaptation across different soil and climate conditions.
- ✓ Cover crops trials to reduce inputs, rebalance the soil, maintain conditions favorable to biological activity, capture carbon from the air (carbon sink).



Plot seeders:

- precision plot seeder with granular and liquid application in furrow
- plot seeder for cereal (also available for plot fertilizer applications)

Harvesting:

- 4 plot harvesters
- 2 threshers



**BIOSTIMULANTS
FIELD TRIALS**

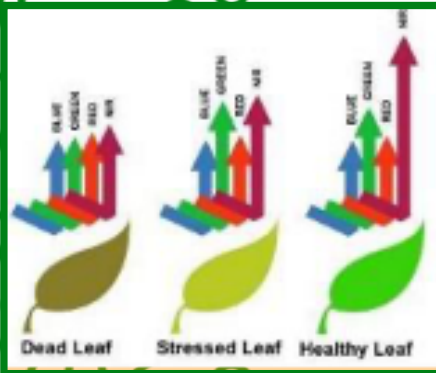
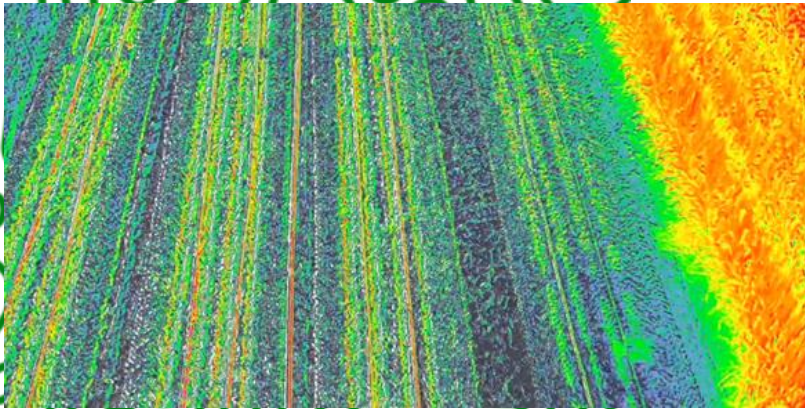
SKILLED IN BIOSTIMULANTS TRIAL SET UP



Agri-Net's technicians has the specific experience to set up biostimulant trials taking into account all the challenges derived by the open field conditions:

- **Field variability:** we look to find the best location in order to minimize the influence of soil or plant characteristics.
- **Requested field conditions,** many trial needs to be established in field with specific characteristics, e.g.: low availability of specific nutrients, high pH, high CaCO_3 , sandy texture, etc. We have a lot of locations with possible useful conditions for such trials.
- Trial in open field have to cope with a number of **agronomical practice**, which need to be evaluated and controlled in order to avoid any influence on the trial results. Moreover, often these practice are essential for the crop management (thinning, watering, pruning, etc.)
- The **farmer maintenance** have to be carefully followed in order to avoid any influence by its nutritional and protection applications.

Agri-Net has also the right experience and the suitable equipment to carry out the assessments on the selected demonstration markers.



TOOLS FOR PROXIMAL SENSING



- ✓ Pocket LAI
- ✓ MultispeQ: Measure photosynthetic phenotypes in field and in controlled conditions
- ✓ Fluorimeter
- ✓ Porometer
- ✓ SPAD MC 100 / DUALEX
- ✓ NDVI Green seeker
- ✓ PH meter
- ✓ Brix refractometer
- ✓ Fruit Durometer, non-invasive firmness tester
- ✓ Penetrometer
- ✓ CANOPEO, crop cover %
- ✓ Colorimeter NIX PRO
- ✓ Laquatwin pocket meters for NO_3^- , Ca^{2+} , Na^+ , K^+ , pH, salt, conductivity.



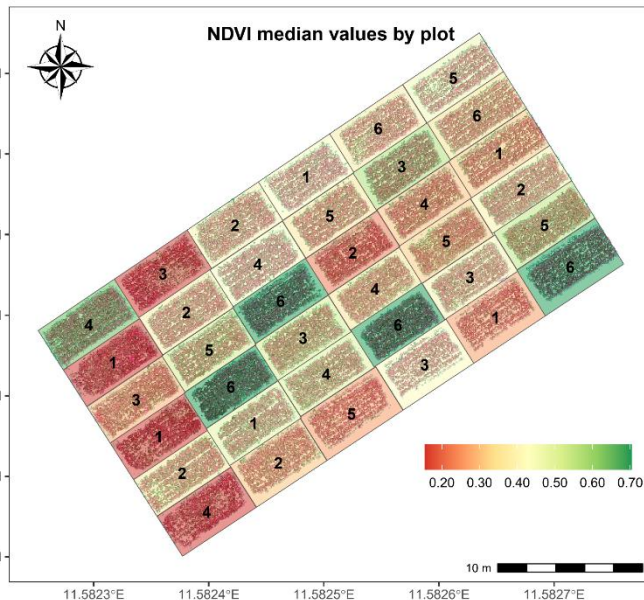
IMAGE ANALYSIS WITH DRONE ACQUISITION OR PROXIMAL CAMERA

Drone imaging

- ✓ DJI, multispectral camera (RGB + RGNRE + RGN)
- ✓ field crops, 3D crops
- ✓ single plant identification and counting - VI computation – VI statistics per plot/plant - plant height estimation - canopy cover computation - field effect modelling and removal.

Analysis of Thermal/RGB/Multispectral images from proximal cameras

- ✓ Mapir Survey 3 cameras/FLIR thermal cameras
- ✓ VI for single plant - extensive VI and shape statistics - canopy cover - leaf damage/pest incidence/leaf area computation on single leaf.



Agri-Net S.r.l
Via Marabini, 14/A
40013 Castel Maggiore –
Bologna (IT)

Agri 2000 FRANCE SARL
5-7 Rue de Lombardie
69800 Saint Priest – Lyon
(FR)

Agri 2000 HELLAS Ltd
Euaggelistrias 23, 24500 Kiparissia
Tiverioupoleos 5, 55132 Thessaloniki
(EL)

Agri 2000 IBERIA S.L.
Poligono Mas de Tous, C/ Lisboa
14a, 46185 Poble de Vallbona –
Valencia (ES)

Agri 2000 NET ROMANIA SRL
Str. Agricultori, 4 077145
Pantelimon – Bucharest (RO)

