

## The Mission of SAFECROP

### Research, Education, Information

SafeCrop is dedicated to innovative research oriented toward plant protection technologies against pests and diseases using sustainable low environmental impact methods.

SafeCrop fosters the development and application of new soft control technologies and the transfer of knowledge and technology between science and agronomy.

SafeCrop supports innovative processes within its goals to be applied in agriculture.

The objective is to speed up the translation of research findings into successful products, processes and services.

SafeCrop backs innovative projects from idea to successful application in farmer's fields.

Research at SafeCrop will fill knowledge gaps and foster new innovative ideas.

Part of its activity focuses on the constraints that hamper the vast scale application of biocontrol and semiochemical based technologies and strategies. The policy of SafeCrop will be that all research has to lead to sustainable, low or zero impact control strategies; therefore a second part of SafeCrop activities is oriented toward questions such as unwanted side effects, environmental and food contamination by agents employed in soft control strategies.

SafeCrop will promote collaboration among internationally renowned research institutions to create synergies of knowledge.

SafeCrop brings together dynamic researchers from various research institutes by supporting their co-operation in applied research & development – both financially and also through services and know-how in innovation management.

SafeCrop serves as centre for education and continuous learning in the field of soft control strategies of pest and diseases of agricultural crops.

SafeCrop operates with strategic alliances. To achieve the ambitious goals SafeCrop fosters synergistic collaborations. Under the umbrella of the partnership with leading research institutions of Europe scientists can initiate and conduct collaborative research without any bureaucratic burden.

## Responsibilities:

Scientific director SafeCrop, Cesare Gessler

Deputy director, Ilaria Pertot

Pathogen Control research unit, Yigal Elad

Insect control research unit, Silvie Derridj

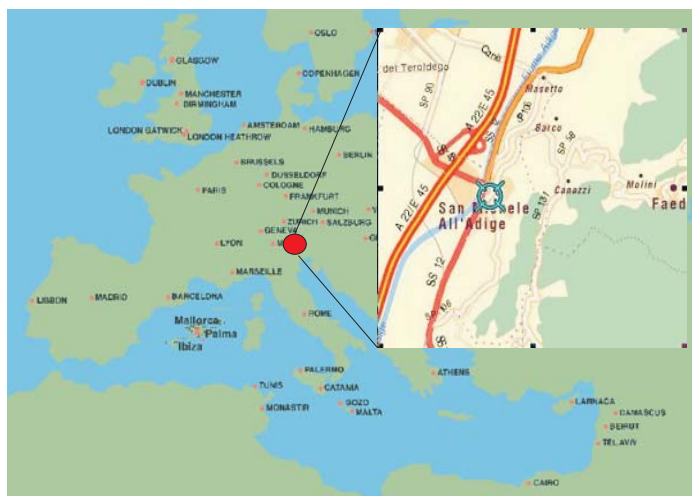
Risk Assessment research unit, Ilaria Pertot

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# SAFECROP

**CENTRE FOR RESEARCH AND  
DEVELOPMENT OF CROP PROTECTION  
WITH LOW ENVIRONMENT AND  
CONSUMER HEALTH IMPACT**



A network collaboration among:

- Istituto Agrario di S. Michele all'Adige (IASMA), Italy
- Institut National de Recherche Agronomique, Versailles (INRA), France
- Swedish University of Agricultural Sciences (SLU), Department of Crop Science, Sweden
- Federal Biological Research Centre for Agriculture and Forestry (BBA), Institute for Biological Control, Darmstadt, Germany
- Agricultural Research Organization (ARO), The Volcani Center, Israel
- Swiss Federal Institute of Technology Zurich, (ETHZ), Institute of plant sciences, Switzerland

Hosted by the Istituto Agrario di S. Michele  
Funded by the Provincia Autonoma di Trento, Italy

## **SafeCrop Research**

SafeCrop encompasses three activity sectors: pathogen control, insect control and risk assessment.

Current activities deal with grapevine, apple, strawberry, small fruits and other horticultural crops as required.

### **Pathogen Control Research Unit (PC RU)**

The long-term objective of the activities of this unit is to reduce chemical fungicide input on crops. It intends to implement pathogen control methods based on the use of micro-organisms, their metabolites or analogous and/or their integration with other non chemical methods such as cultural ones.

*PC RU priorities include:*

- selection and identification of field-conditions-effective BCAs by means of high throughput screening methods based on pathogen-plant-BCA system and molecular analyses;
- characterizing the spectrum of activity of BCAs and modes of action;
- isolation of bioactive compounds from culture of micro organisms known to be active against pathogens;
- study the methods for massive production of potential BCAs and bioactive compounds;
- preliminary formulation of BCAs and bioactive compounds for use in field trials and evaluation of selected formulations under commercial conditions;
- evaluation of activity, consistency, survival and diffusion of agents applied in the field under different environmental conditions;
- integration of agents with different modes of action and ecological requirements and with other environment friendly methods;
- evaluation of effect of agents on insect behaviour and on plant physiology;
- compose guidelines for BCAs trials for registration and registration processes.

### **Insect Control Research Unit (IC RU)**

The long aim of the activities of this unit is to develop new effective and environmental friendly control techniques based on Insect Behavioural Regulators

(IBRs) that could replace the traditional insecticides. IBRs could also be useful to reduce the agricultural chemical input by improving the monitoring techniques necessary to time the treatments.

*IC-RU priorities include:*

- identification and biological activity of insect semiochemicals;
- identification of plant volatiles involved in the research and host plant selection;
- identification of plant surface metabolites involved in host plant acceptance and the selection of the insect pest oviposition sites;
- role of plant surface metabolites in plant resistance to the insect oviposition;
- study on the detection mechanisms used by the insect to recognise pheromones and gustatory signals involved in feeding and reproductive behaviour;
- use of plant metabolites able to modify the insect behaviour to improve the efficacy and/or the persistence of BCAs against insects;
- investigation of the biodiversity of indigenous insect pathogens, especially fungi, within different ecological zones and agricultural systems;
- development of experimental biological products against insect pests;
- investigation on the impact of abiotic environmental factors on survival and performance of bio-insecticides;
- interactions between chemical and biological control measures commonly used in Integrated Pest Management (IPM).

### **Risk assessment, molecular tools and side effects of non chemical methods for control plant pathogens and parasite Research Unit (RAMT RU)**

The objectives of the activities of this unit are to describe the fate of the BCAs in the agricultural ecosystems, to ascertain the lack of environmental and health risk in the use of BCAs and other natural metabolites and to furnish molecular tools for the other RU, in particular to integrate the knowledge of molecular biology, with classical biology. The purpose is to develop brand new molecular markers both for insects and for plant pathogens, in particular to obtain co-dominant highly informative PCR-based markers. Of highest interest will be the establishment of a high throughput automated routine analysis of organisms in

order to reduce human handling to a minimum, process hundreds of samples per time and to allow simultaneous diagnosis, quantification and/or tracking of several organisms.

Large scale application of soft control strategies using BCAs may raise questions such as unwanted environmental and food contamination.

This unit will furnish the know-how to evaluate long term ecological and economical impacts of BCAs.

*RAMT RU priorities include:*

- BCAs marker development;
- spread and colonisation monitoring (qualitative) presence/absence of BCA at non target sites;
- understanding plant-pathogen-BCA interactions in field and studying environmental effects on BCAs;
- chemical characterisation and identification at molecular level of modes of action (where relevant) of metabolites active against the pathogen;
- evaluation of the effects of BCAs on non-target organisms and beneficials;
- BCAs environmental safety, including identifying the potential to produce unwanted metabolites on non-target sites;
- evaluating the effects of BCAs on transformed products;
- risk evaluation of forced evolution of the pathogen toward avoiding BCA-effect;
- evaluation of the side effects on beneficial organisms of the IBRs and the metabolites active against insects and pathogens;
- risk evaluation of bioinsecticides and safety to relevant non-target arthropods other than bees.

### **Education and Information**

SafeCrop hosts regular courses for any level of education, in collaboration with its partners and with various Universities.

SafeCrop is the host and organizer of international workshops and has strong collaborations with IOBC-WPRS.

For a complete and updated list of SafeCrop educational activities please check our web-site [www.safecrop.org](http://www.safecrop.org)