Contents

MPU 2022

WELCOME NOTE

Welcome Note

MPU 2022

Dear participants,

It is our great pleasure to welcome you to the 16th Congress of the Mediterranean Phytopathological Union (MPU2022) in Limassol, Cyprus. As scientists knowing very much about epidemics and pandemics we remained committed to our common goal to deliver a conference with physical presence two years later from the programmed meeting in 2020. Although the Plant Health Year is not celebrated officially in 2022 the COVID19 pandemic showed to the world that above all is health and health is closely related and 100% sustained from food quality and availability. During this period almost all sectors had closed down for few days, weeks or months but agriculture and food production remained active to feed the world. Our sector answered questions, modified and improved practices, in order to continue to produce the quality and the amounts of food as normal.

MPU2022 entitled "Safeguarding Mediterranean Plant Health" promotes dissemination of the latest scientific advances and encourages dialogue and collaboration between researchers interested in all aspects of Phytopathology. This year we celebrate seeing again all good friends and colleagues missed since 2017 in Cordoba and we also celebrate the 60th birthday of the Union (1962-2022).
We have 83 oral and 63 poster presentations and 15 keynote presentations from leading scientists in all areas of plant pathology and plant stress research. Professor Dirk Inze (ERC Board Member) will open our conference with a keynote on abiotic stresses due to climate change, an issue of paramount importance for our region. All the work (abstracts) will be published in the international journal Phytopathologia Mediterranea while a special issue of the Journal is expected to host invited papers from the conference.

We have organised 5 special sessions in cutting edge subjects of phytopathology and beyond. We host a special session organised jointly with the Arab Society of Plant Protection, a workshop offered by Professor Matteo Garbelotto on invasive pathogens of forest species, a session dedicated to all European funding agencies to present the current opportunities for funding our research, training/education and other related activities and we finish our conference with a round table discussion on biopesticides and biostimulants where researchers and industry representatives will discuss current issues and future perspectives on the matter.

Within our offered sessions there is a unique opportunity to learn more with a special session on gender in plant pathology. Gender equality is the number one priority of EU and all its schemes and agencies and is considered the most important issue in research, research funding and higher education in the current EU framework requiring immediate actions. The Cyprus University of Technology and the Department of Agricultural Sciences, Biotechnology and Food Science participate in a leading innovative initiative of European agrifood academic and research institutions and organise this very important initiative with top experts. Least to say that organisations that do not fulfil gender equality plans by the end of 2022 will not be eligible for funding from EU sources. This session and via the built network, we offer a great opportunity to learn and help your institution to comply with this very difficult task.

Last but not least, we made a great effort to guarantee external funds for prizes for young researchers (poster and oral presentations) and we would like to thank our sponsors and supporters, Horta, Di Agro, Agdia, Ministry of Agriculture, Rural Development and the Environment, MDPI Plants, Deputy Ministry of Tourism of the Republic of Cyprus, and the Cyprus University of Technology.

We hope that you will find this program interesting and thought-provoking and that it will provide you with a valuable opportunity to share ideas with other researchers and practitioners from institutions around the Mediterranean and beyond.

Conference Chair
Dr. Dimitris Tsaltas
Department of Agricultural Sciences, Biotechnology and Food Science
Cyprus University of Technology

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Tito Caffi

Innovative Smart Technologies for Agricultural Production and Plant Health

Abstract: Pests are defined by FAO and IPPC as “any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products”. They can cause enormous crop loss worldwide with damages that can occur in the field, from sowing to harvesting, and also in the storage. Secure food supply for the future generations requires environmentally safe and sustainable production.

Main goal of the modern agriculture is to reduce intensive fertilizer and pesticide use and decrease heavy exploitation of natural resources (water, soil, energy). Precision agriculture (PA) is a collection of agricultural practices that focus on specific areas of the field at a particular moment in time. The main goal of precision agriculture can be summarized in doing “the right thing, at the right time in the right place”). With the recent scientific advancements, technological innovations and legislatives tools it is nowadays possible to achieve these strategic goals and to increase sustainability in agriculture. In 2020, the International Year of Plant Health, the use of Smart Technologies can contribute to enhance plant health, reduce hunger and poverty, protect the environment, and boost economic development.

The actual availability of innovative tools and data management techniques, also leading to big data management and analysis requirement, allow to think about an integrated system that provides phytosanitary monitoring for some pilot crops which is effective, rapid, objective, repeatable in the most varied environmental contexts, and therefore suitable to provide appropriate support to the various phytosanitary control needs in a region or an area. It is possible to integrate into modern decision support systems information, protocol, guidance in order to allow trained personnel to carry out surveys and data collection, through information, alerts and guidelines (photographic or video supported) provided by the system.

This approach could lead to a complementary monitoring system and enhancement to the forecast models, an aspect that will allow to optimize and increase the information and alerts provided to the operator, guaranteeing a clearer and more aware picture of the phytosanitary and physiological state of the plant.

Session topic: Innovative Smart Technologies for Agricultural Production and Plant Health

Stéphane Compant

The plant inside as a diverse microhabitat: communities, niches, colonization behaviour of beneficial endophytes and relation to plant growth and health

Abstract: Plant host different fungal and bacteria in organs like roots, stem, leaves, fruits and seeds. Most of them derive from the soil and the rhizosphere as stated since the XIXth century, but other sources like the anthosphere, carposphere, phyllosphere, laimosphere and caulosphere can also lead to establishment of endophytes inside plant tissues. Other microbes can further derive from animals or from plants growing near each other. A thorough understanding of the communities, routes and niches colonization of endophytes in the phytobiome viewpoint has led to a better knowledge on how to use specific microbes for stimulating plant growth and increase host health but also to understand better how plants shape their microbiome. Most of the research has been done either on fungi or bacteria but recent studies further show that some bacteria can colonize beneficial fungi internally as endofungal bacteria and increase their beneficial effects on plants, leading further to a strategy of using multipartite interaction to boost plant protection.

Session topic: Microbiomes and their role in plant health

Vasileios Fotopoulos

Plant and seed priming for improved growth and abiotic stress protection under a changing climate

Abstract: Increased frequency of extreme environmental events resulting from global climatic changes remarkably influences plant growth and development. Close examination of plant-to-plant communication in nature has revealed the development of unique strategies from plants for responding to abiotic stress, with one of the most interesting being through priming for improved defense responses. The process of priming involves prior exposure to a biotic or abiotic stress factor making a plant more tolerant to future exposure.

Priming can also be achieved by applying natural or synthetic compounds which act as signaling transducers, 'activating' the plant's defense system. An up-to-date overview will be presented describing the research carried out at the Cyprus University of Technology using priming agents towards induced acclimation of plants to environmental challenges. In addition, recent findings will be presented on the evaluation of chemical compounds as well as nanoparticles that potentially display growth promoting properties in plants, closely related to our existing expertise and previous observations in priming against stress.

Dirk Inzé

1. Plant Biology and Climate Emergency
2. Genome editing: Enabling genome editing for European agriculture: will scientific evidence prevail?

Abstract: The world is experiencing an unprecedented climate crisis that requires urgent action at all fronts. Plant biology offers great opportunities both for adapting to climate change as well as for mitigating the accumulation of greenhouse gasses.

It is expected that higher temperatures and longer drought episodes will greatly reduce crop productivity in many area's including the Mediterranean basin. Understanding how plants rewire their growth and development in response of environmental cues such as drought is the first step towards breeding and/or engineering stress tolerant crops. I will illustrate the challenges of achieving this ambitious goal by our research on drought responses in maize. The molecular and phenotypic comparison of drought response of maize plants cultivated in growth chambers, greenhouse and field conditions highlighted the importance of applying an experimental 'lab to field to lab' approach. Furthermore, drought responses involve many interacting genes. Genome editing offers great perspectives not only to tackle complex multi-genic traits such as drought but also to engineer drought tolerant crops.

Plants are fantastic organisms that evolved to efficiently use CO2 for growth and development. The selection of plants with improved CO2 sequestration capabilities, above ground and below ground, are likely to become a valuable tool to combat climate change. Obviously such plants should be resilient to environmental stresses and show a low dependency on fertilizers and agrochemicals. I will discuss various approaches on how to develop such plants for climate emergency.

Abstract 2: Agriculture and food production must become more sustainable in a world facing a growing population under changing climate conditions and environmental degradation. All possible approaches, including improved plant breeding technologies, are essential to address these challenges. In order to

develop new crop varieties, scientists and plant breeders need to have access to the widest possible array of breeding tools. The most recent addition to the toolbox is precision breeding, also known as genome editing with a preference for CRISPR. This technology allows for scientists and breeders to develop desired crop varieties in a faster, relatively simple and much more directed way compared to older breeding technologies.

However, there are legal and procedural uncertainties regarding the status of genome edited crops in Europe. While the CRISPR technology is being adopted at an unprecedented speed, the current regulatory framework remains outdated. Moreover, the European Court of Justice (ECJ) ruling from 2018 (C-528/16) brought even more confusion because of the interpretation that crops obtained by precision breeding are subject to the GMO regulatory provisions. This regulatory burden even applies to crops with the smallest, specific CRISPR-mediated DNA alteration, that can also occur spontaneously in nature.

The ruling leads to inconsistency in the legislation because of the fact that conventional mutagenesis -which results in thousands of random DNA alterations- is exempt from the GMO regulatory provisions. The legislation no longer correctly reflects the current state of scientific knowledge. Besides, subjecting genome-edited crops to the current EU GMO regulation will delay the development of climate-resilient crops, hinder progress in sustainable agriculture, reduce EU's competitiveness and hamper global trade.

The ruling is hampers the cultivation of genome edited crops with beneficial traits for our health or the environment such as improved nutritional composition, improved digestibility, lower content of anti-nutritional components, reduced allergenicity or requiring less input.

The scientific community in Europe responded united and published a position paper and an open statement to call upon the European Commission and the European Parliament. With a growing number of signatories, reaching currently to 129 European research institutes and organizations, from 21 different Member States and the UK, the network EU-SAGE was launched. EU-SAGE stands for European Sustainable Agriculture through Genome Editing and aims to provide information about genome editing and to promote the development of European and EU member state policies that enable the use of genome editing for sustainable agriculture and food production. I will provide an update on the ongoing discussions with the European Commission. Hopefully scientific evidence will prevail.

Session Topic: Molecular pathogen-host interactions

Matteo Garbelotto

Cypress Canker: a model pathosystem to study fungal invasions

Abstract: Our understanding of invasions by plant pathogens lags behind compared to that of other biological invasions. Cypress Canker Disease (CCD) caused by the fungus Seiridium cardinale (Sc), has emerged as an excellent pathosystem to further our understanding of fungal invasions. By using a population genetics approach, we have shown that Sc is endemic to the interior of California, where the disease is expressed exclusively on exotic, off-site or artificially-bred cypress species. The early 1920s outbreak in the interior of California was responsible for two introductions: one in Italy and one in New Zealand. Coalescent analyses showed that Italian population of Sc played a major role in the diffusion of the pathogen throughout the Mediterranean.

Phenotypic traits in Mediterranean invasive Sc populations indicate that small conidial size, high phenotypic plasticity and high sporulation potential are key traits for a successful invasion, while high virulence and high growth rate are not necessary. Comparative analyses indicate that geographically isolated S. cardinale populations are now genetically and phenotypically distinct, and by inoculating a range of California Sc genotypes on Italian cypress, we show that resistance to CCD can be eroded by California genotypes. Will a further Sc introduction occur? In a recent study, we show that within the last 20 years. the Mediterranean and California populations served as sources for new introductions in New Zealand and Morocco, respectively, thus proving additional introductions are a distinct possibility. In conclusion, our data prove that invasive populations cannot be regarded analogous to source populations that generated them.

Session Topic: Forest Pathology: Cypress canker

Baldissera Giovani

Euphresco as a platform to link research and policy in the Mediterranean area and abroad

Abstract: Mediterranean agriculture, forests and other environments are seriously threatened by numerous quarantine and emerging pests. The negative impacts caused by these pests are expected to increase due to the acceleration of global trade and to climate change that respectively favour the movement of these organisms over long distances and facilitate their adaptation to and establishment in new environments.

In the face of these challenges, the Mediterranean region is particularly vulnerable due to the shortcomings in national quarantine systems, limited expertise and phytosanitary infrastructures, and the lack of funds for research activities in support of statutory plant health.

The strengthening of research in the field of plant health is one of the main challenges that countries in the Mediterranean region have to address. The diversity of priorities both in terms of pests and in terms of infrastructures and skills has reduced the impact of national efforts, but plant health challenges require rethinking of the organization of research activities in all countries and their coordination in order to increase efficiency and impact.
Coordination at Mediterranean level will reduce the fragmentation of actions; it will promote convergence of national programmes; it will build critical mass.
In this context, several Mediterranean organizations and initiatives have joined forces to improve international collaboration in and coordination of research efforts on plant health and plant protection of Mediterranean countries. The various activities undertaken so far and the results of discussions with Mediterranean country representatives will be presented.

Session Topic: European and Mediterranean Plant Pathology

Vladimiro Guarnaccia

Fungal pathogens of wood: are they a threat to Mediterranean fruit crops?

Abstract: Intensification, diversification and globalization regularly happen, causing a broad range of collateral effects on agriculture. The risks of disease dissemination via trade and the movement of goods and people is increasing. Moreover, climate change is also affecting plant health by modifying the interactions between host plants, pathogens and the environment.

Fruit tree plantations are increasingly threatened by fungal diseases. It has been also observed how fruit trees share fungal pathogens with woody plants that are not considered to be trees. Both primary and opportunistic pathogens can cause various symptoms such as cankers, twig blight and wood rotting. Diaporthe and Neofusicoccum spp. are examples of pathogens able to infect a broad range of fruit trees. Moreover, there are numerous latent pathogens such as those in the Diatrypaceae family or in the Cytospora and Neocosmospora genera, and many others.

Recent findings about fungus/host combinations will be presented, with emphasize on the connection between species identification studies and the development of modern diagnostic tools. Moreover, factors such as cultivar diversity, propagation material health and rootstock selection, need to be investigated in relation with the pathogens, for providing the necessary support to the producers of a such high economic important agriculture sector.

Session Topic: Wood diseases in fruit corps

George Karaoglanidis

Fungicide resistance in Botrytis cinerea populations from protected crops in the Mediterranean basin: Current status and implications with its management

Botrytis cinerea is one of the most destructive pathogens infecting numerous crops. Among them are included several important crops cultivated in the Mediterranean basin such greenhouse grown vegetables or strawberries. Resistance of the pathogen to fungicides used for its control is widespread throughout the Mediterranean basin in crops heavily treated such as those cultivated in greenhouses and it is associated with reduction in product`s performance and control failures.

In this report the current status of resistance to major botryticide groups such as SDHIs, QoIs, hydroxyanilides or anilinopyrimidines in Botrytis spp. populations will be reviewed and detailed information will be given on the methodologies of resistance detection, variability of mutations conferring resistance to fungicides, their effect on the fungal sensitivity to the different active ingredients and the fitness of resistant strains. Furthermore, implications of cross-resistance patterns complexity and fitness cost for the resistant mutants will be discussed in relation to resistance management in greenhouse grown vegetables taking into account the recent introduction of new active ingredients into the agricultural practice, such as new molecules belonging into SDHIs.

Additionally, future prospects and challenges will be presented with emphasis on the role of alternative control methods such as the integration of Biological Control Agents (BCAs) with conventional fungicides in reducing the fungicide selection pressure on fungal population and, thus, minimizing the risk for resistance development.

Session Topic: Integrated disease management

Blanca Landa

Current situation of Xylella fastidiosa in Spain: Main research projects ongoing to understand and tackle this pathogen

Abstract: X. fastidiosa (Xf) was first reported in 2016 in Majorca, in the Balearic Islands, and in 2017 in Alicante province, Mainland Spain. Currently, three Xf subspecies and four STs have been detected in the Balearic Islands (subsp. fastidiosa ST1, subsp. multiplex ST7 and ST81, and subsp. pauca ST80). On the other hand, only Xf subsp. multiplex ST6 have been detected in the Valencian Community where the Demarcated Area covers an extension of >136,200 hectares, of which over 1,100 hectares, 12,500 orchards and 90,000 trees have been already eradicated as of November 2021.

This talk will present the main research initiatives going on in Spain aimed to understand Xf epidemics and mitigate its impact not only in Spain, but also in Europe. These main research initiatives have contributed to fill knowledge gaps on Xf in Europe, gathering fundamental information on several aspects: i) Characterizing the genetic population structures of X. fastidiosa in the different EU outbreaks, including Spain, and linking the genetics of the bacterium with its pathways of entry, ii) testing and developing new diagnostic tools based on molecular and proximal- and remote-sensing approaches; iii) searching for new control tools targeting the bacterium in the plant or searching for host resistance, and iv) understanding the epidemiology and modeling disease development and developing risk analysis. All these results have contributed to provide elements to inform Spanish and EU policy related to Xf management at different spatial scale (from regional to EU level) and socio-economic contexts.

Session Topic: Xylella fastidiosa research in Europe

Antonio F. Logrieco

From Myco-key to myco-twin: mycotoxin management along food/feed chain

Abstract: Fungal disease is one of the most important contributors to the occurrence and severity of mycotoxin contamination of crop plants. Phenotypic and metabolic plasticity has enabled mycotoxigenic fungi (MF) to colonize a broad range of agriculturally important crops and to adapt to a range of environmental conditions. New mycotoxin-commodity combinations provide evidence for the ability of fungi to adapt to changing conditions and the emergence of genotypes that confer enhanced aggressiveness toward plants and/or altered mycotoxin production profiles. Among diseases caused by MF, the most important are the result of attacks carried out by species complexes. Examples of these diseases are the Fusarium ear rot of maize, Fusarium head blight (e.g. wheat, barley, and oat), black point of wheat kernels by Alternaria alternata species complex and related species; and various rot caused by Aspergilli. Mycotoxins in plant products and in processed food and feed have a significant economic impact and pose a serious problem for animal and human health. The management of good agricultural practices in the pre- harvest is a key issue for minimizing the risk of mycotoxin accumulation in the crops before the harvest. Such practices can involve crop rotation, tillage, proper fertilization and fungicide or biological control distribution, variety selection, timely planting and harvests and the control of the insects which often facilitate the toxigenic fungal species infection. Moreover, it is extremely important to prevent post-harvest contamination and develop practical and effective post-harvest procedures for mycotoxin reduction in the food supply chains and to provide alternative and safe use options for contaminated batches. An update review will be given on integrated management of pre-and post harvest practices aiming at the minimizing the risk of mycotoxin contamination along chain and main effective solutions developed by EU MycoKey (http://www.mycokey.eu/) and MycoTwin (https://www.mycotwin.eu/project) projects.
This presentation was supported by the EU Project N. 952337

Session Topic: Mycotoxins: prevention and control

Demetris Tsitsigiannis

Integrated pest management smart technologies to precisely detect and control plant diseases

The ever-increasing demands of international markets for safe food have led to the development of integrated plant protection strategies for a more efficient and sustainable agriculture and to more robust certification and control systems for agricultural products. Novel integrated management systems (IPMs) of particularly serious plant diseases and mycotoxin contamination of plant products are being developed using innovative smart agricultural systems. The purpose is to: (a) accelerate the prognosis of disease outbreaks through prediction models; (b) develop advanced methods of artificial intelligent diagnosis using spectral imaging techniques or mass spectrometry sensors for accurate detection and assessment of disease severity; (c) evaluate novel biocontrol and chemical plant protection products to control effectively the diseases; (d) develop innovative prototype sprayers actuating different nozzle types and adopting variable rate control based on canopy characteristics, the pathogen dispersal and disease development. We also develop and validate Decision Support Systems (DSS) based on computer-based knowledge systems that enable disease prediction and monitoring by combining epidemiological data, biological and chemical control strategies and precision farming tools. These systems determine the critical stages of the various plant protection spray interventions taking into account (a) the environmental conditions (temperature, rainfall, relative air humidity and leaf wetness obtained from local meteorological stations), (b) the developmental stage of the host, (c) the cultivation practices, (d) the microbiological load and other parameters. The ultimate goal of the smart technologies is to reduce the European agriculture reliance on agrochemicals resulting in lower residues and reduced impacts on human health.

The presented research has received funding from the European Union's Horizon 2020 research and innovation programmes under grant agreement No 773718 (OPTIMA) and No 778219 (OchraVine Control).

Session Topic: Smart and Precision Plant Pathology

Marie-Agnes Jacques

Research mobilization in France to fight the threat posed by Xylella fastidiosa

Once thought to be restricted to the Americas, the plant-associated bacterium Xylella fastidiosa has been blooming since 2013 in Europe. Strains of this bacterium were detected in 2015 in Corsica and later on in continental France. A large diversity of plants comprising mostly ornamental plants was detected infected by diverse strains of the bacterium. Comparative genomics and adapted typing methods allowed to reconstruct their evolutionary history and to give clues concerning its routes of introduction.

French research teams contribute to a better knowledge of this priority pathogen by providing complementary knowledge of the biology of this pest, its dissemination and factors impacting dispersal, and the trophic network involving this bacterium, its hosts and its vector. This research mobilization is included in the large European research mobilization and has beneficiated from dedicated European projects.

Session Topic: Xylella fastidiosa research in Europe

Anna Maria D'Onghia

1.Ciheam Policy in Plant Health to Enhance Food Security in the Mediterranean Region

2. Applications of remote sensing and information technology in the surveillance of quarantine diseases of fruit tree crops

Abstract 1: Most of pests and diseases affecting Mediterranean crops are seriously compromising food security and, consequently, the sustainability of rural populations in several countries in the Mediterranean region. The importance of Plant Health has been clearly highlighted by UN that has declared the 2020 as the International Year of Plant Health.

CIHEAM, an intergovernmental Organization of 13 Member States, has gained a long experience in plant health which is one of the main pillars of the CIHEAM Strategic Agenda 2025 – adopted in 2016 by the Ministries of Agriculture of CIHEAM Member States. It is approached through: training of researchers, officers, professionals; applied research linking local scientists with the international research communities; participatory governance that means encouraging discussions and interactions among scientific, institutional and private stakeholders; and cooperational developing programmes enhancing country capacity building and awareness raising.

The CIHEAM Institute of Bari, in particular, has more than 30 years of experience in plant health, implementing and financing numerous international research initiatives in the Mediterranean region and neighboring countries (e.g. Iran, Sultanate of Oman, Iraq). It is also engaged in several initiatives funded by the Italian Cooperation addressing plant health in several countries (Mediterranean, Balkan, African, Near eastern and Middle eastern countries). These initiatives have delivered institutional capacity building and technical assistance to hundreds of officials of national and local entities. Furthermore, in line with the statutory mission of CIHEAM Bari (higher education, research and development cooperation), since 1985 the Institute has delivered specialized and post-graduate diplomas on Integrated Pest Management to thousands of trainees coming from over 50 countries.

Particular attention of CIHEAM is posed on early surveillance, detection and control of transboundary pests and diseases which may seriously threat crops, environment and sustainability of rural populations (e.g. Xylella fastidiosa). The achieved results have demonstrated that it is possible to ensure the shift towards sustainable production if quarantine measures are strengthened and a comprehensive phytosanitary management is applied. CIHEAM initiatives are therefore focusing on harmonizing national rules with the EU technical/ phytosanitary/ legal standards, in order to safeguard agriculture and promote improvement in domestic and export trading of safer food in conformity with Governments' strategic plans.

Session Topic: European and Mediterranean Plant Pathology

Abstract 2: Early and accurate detection systems for quarantine diseases of fruit tree species are essential for efficient large-scale surveillance, rapid implementation of control measures and evaluation of their effects. The new frontiers of technology can also offer several smart solutions in the field of plant health, facilitating the task of operators in implementing more efficient, accurate, timely and cost-effective real-time and large-scale surveillance programs. It is therefore necessary to have a considerable amount of data (e.g. climate, geographical, satellite, diagnostic) accurately captured at a distance and on the ground, using applications, sensors, forecasting models, specific diagnostic methods, etc. To this aim, Remote sensing (RS) can help to identify infections on a large scale, even when symptoms are not yet visible.

There are many platforms and sensors designed for the acquisition of remote sensing data, ranging from satellite, aircraft and, more recently, UAS. The availability of high resolution time series of images such as Sentinel-1 and Sentinel-2, introduced with the European Copernicus programme, has greatly facilitated the scale-step in the use of Earth Observation (EO) data for agricultural and phytosanitary applications.

In addition to RS, Information Technology (IT) is another important tool for plant protection programs allowing accurate storage, retrieval, transmission and manipulation of monitoring data. Various IT tools can be used for this purpose such as diagnostic devices, Apps (accurate on-site data acquisition), DSS, etc. An overview on RS and IT systems is provided, with particular reference to those already available and applied in the official pathogen monitoring programmes (Citrus tristeza virus, Xylella fastidiosa in Apulia region, Italy), e.g.: (i)an automatic procedure for tree counting, using GeoEye-1 multispectral image; (ii)prediction maps using WordView-2 satellite image in GIS environment for early detection of CTV-suspected trees; (iii)photointerpretation of high-resolution aerial images for the identification of OQDS trees in the demarcated area of X. fastidiosa; (iv)several applications for accurate field data acquisition by NPPOs (e.g. Apps for Xylella fastidiosa, XylApp, XylAppEU, XylAppNENA) and citizens (XylAppcitizens); (v) integrated DSS made of database, forecasting models and users interfaces.

Session Topic: Smart and Precision Plant Pathology

Margreet van der Burg

Gender in plant health and pathology: exploring the research agenda

This presentation will take the audience on a short journey to explore gender into the plant pathology research agenda. With some historical and contemporary examples it will be illustrated how women differently from men are connected to plant health and pathology and its research. It ends with showing windows of opportunity what research including gender can help dealing with the current challenges the field faces.

Session Topic: Why Gender matters in Plant Pathology and beyond

Panagiotis Sarris

Molecular host-microbe interactions in plants: from microbes to host innate immunit

In their long history of interspecific interaction, plants and invading microorganisms –beneficial or pathogenic – are constantly embroiled in complex co-evolutionary dynamics. Several plant associated microorganisms have acquired an arsenal of sophisticated colonization mechanisms to manipulate the physiological processes of their hosts. These mechanism also include specialized proteins, known as “effectors” that are utilized by microbes to promote colonization.

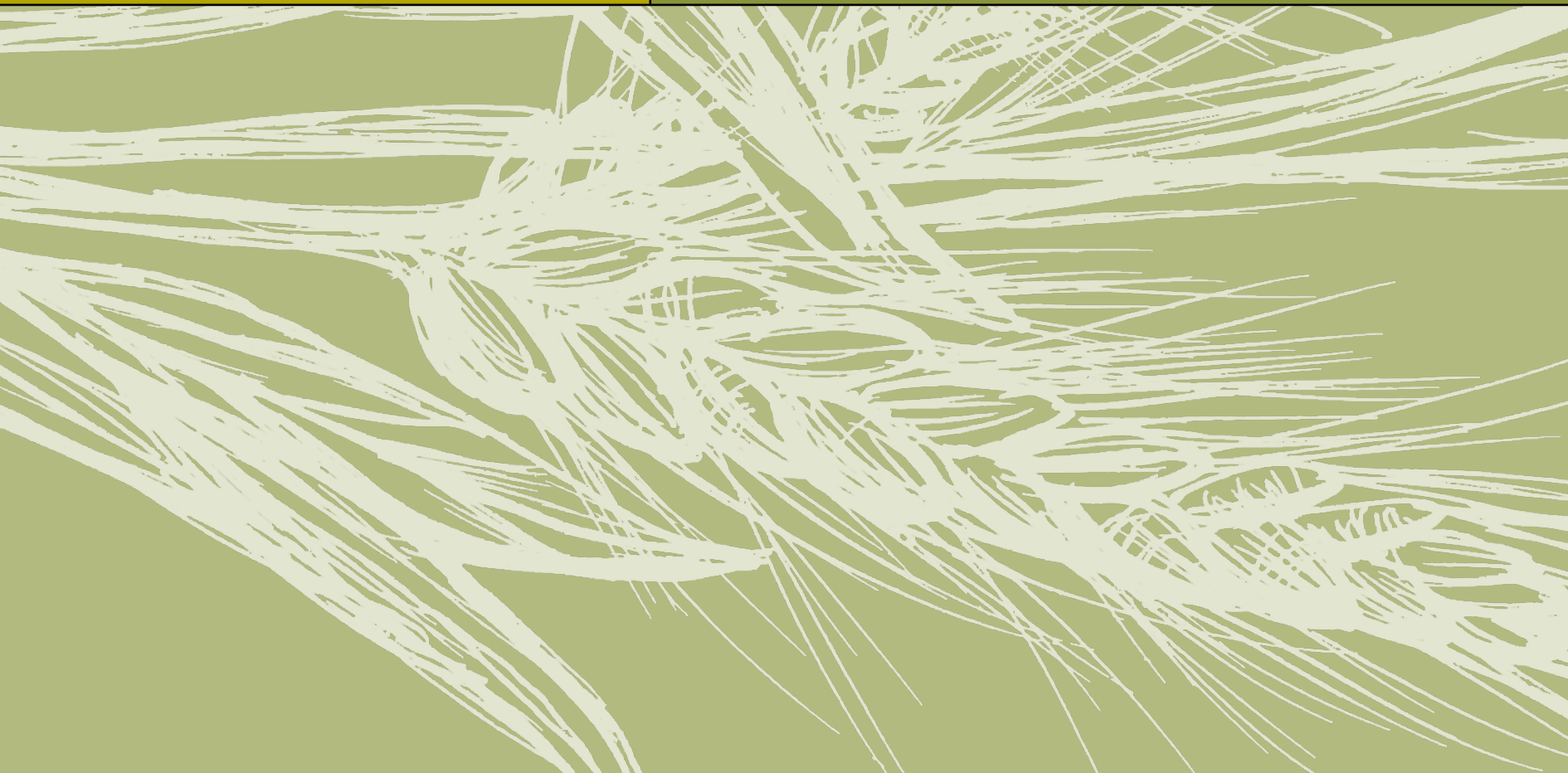
However, their molecular function(s) and their targets in the host-cell, are largely unknown, for the vast majority of these effectors. Today, this still is one of the major questions in the Molecular Plant-Microbe Interactions (MPMI) research field. However, the effectors’ activities/functions can be used as tools to identify important components of plant innate immunity and physiology that could potentially lead to innovative strategies for crop improvement.

Plants, on the other hand, have evolved a well-organized and complex innate immunity system, to recognize invasion. The recognition occurs through the perception of microbial structural patterns, as well as, the secreted effector proteins, by specialized transmembrane or intracellular receptors of the host-cell. The microbial effectors are mainly recognized, in resistant hosts, by members of the NLR (Nucleotide-binding Leucine-rich Repeats receptors) receptors’ family. The elucidation of plant NLRs’ molecular function, will significantly help the future development of novel and/or synthetic immune receptors with new recognition capacities, in crops.s.

PROGRAMME OVERVIEW

Monday 04 April	Tuesday 05 April	Wednesday 06 April	Thursday 07 April	Friday 08 April
	Opening Ceremony & Keynote Speech	Parallel Sessions	Parallel Sessions	Excursion
BREAK				
	Parallel Sessions	Parallel Sessions	Parallel Sessions	
BREAK				
	Parallel Sessions	MPU meets the National Delegations	Parallel Sessions	
BREAK				
Registration & Welcome Reception	Parallel Sessions	MPU meets the National Delegations	Parallel Sessions	

PROGRAMME



17:00 - 19:00	REGISTRATION
18:30 - 20:00	WELCOME RECEPTION

9:00-9:30	**Opening Session** **Chair:** D. Tsitsigiannis & D. Tsaltas **Room:** Panorama
9:30-10:00	**European and Mediterranean Plant Pathology** **Chair:** Dimitris Tsitsigiannis **Room:** Panorama
	Euphresco: a platform to link research and policy in the Mediterranean area and beyond ***Baldissera Giovani***
	CIHEAM Policy in Plant Health to Enhance Food Security in the Mediterranean Region ***Anna Maria D'Onghia***
10:00-10:30	**Opening Keynotes** **Chair:** Dr Dimitris Tsaltas **Room:** Panorama
	Plant Biology and Climate Emergency ***Dirk Inze***
10:30 - 11:00	**COFFEE BREAK & POSTER SESSION I**
11:00 - 13:15	**Why Gender matters in Plant Pathology and beyond** Special Session offered by Gender-SMART **Room:** Panorama
	Keynote Talk Gender in plant health and pathology: Exploring the research agenda ***Margreet Van der Burg***
	How gender equality, innovation and excellence in research are highly correlated? Practices, Tools & Methods ***Panayiota Polykarpou***
	Better together: Gender Diversity and Inclusion in the workplace ***Maria Angeli***
	Round Table Discussion What are the benefits of diversity and equal representation of genders in academia and industry? Challenges and good practices Panelists:Blanca Landa, Anna Maria D'Onghia, Khaled Makkouk, Maria Kaiafa, Panayiota Polykarpou (Moderator)
13:30 - 14:30	**LUNCH BREAK**

14:30-15:00	Keynote Talk **Molecular host-microbe interactions in plants: from microbes to host innate immunit** **Panayiotis Sarris**		
15:00-16:00	**Molecular host-microbe interactions in plants: from microbes to host innate immunit - Session A** **Room:** Panorama	**ASPP-Session A** **Chair:** Khaled Makkouk **Room:** Megaron C	**Workshop-Understanding Invasive Forest Diseases (15:00-18:00)** Matteo Gorbelloto **Room:** Megaron B
	Uncovering the mechanisms involved in Pinus pinaster resistance to pine wilt disease by analysis ofcoding and non-coding transcriptomes ***Celia Migue***	Pathogenic viability of wheat rust diseases in the southern and eastern Mediterranean region: currentstatus, challenges, and regional collaboration ***Kumarse Nazari***	
	The necrosis and ethylene inducing gene VdNEP as a molecular marker for differentiation between Verticillium dahliae pathotypes *Alexandra Triantafyllopoulou, Aliki Tzima, Andriani Tzanaki, Olga-Iakovina Balomenou, Ioannis Tsoutsos, Rafael Jimenez-Diaz,* ***Epaminondas Paplomatas***	Epidemiology and management of legume and cereal viruses in Arab and Mediterranean region ***Safaa Kumari****, Asma Najar, Nader Asaad, Abdul Rahman Moukahel*	
	Biological Control of Aspergillus carbonarius and Botrytis cinerea in Grapevine Berries and Transcriptomic Changes of Genes Encoding Pathogenesis-Related (PR) Proteins. ***Danai Gkizi****, Eirini Poulaki, Sotiris Tjamos*	Phytoplasmal and Viral diseases of fruit crops in the East Mediterranean countries ***Elia Choueiri***	
	Comparative proteome analysis provides new insights into the complex responses of Citrus aurantium grafted with C. sinensis and infected with Citrus tristeza virus *Marlene Trindade, Susana Dandlen, Liliana Anjos, Amílcar Duarte, Deborah Power,* ***Natalia Marques***	Rapid risk appraisal for potential entry, establishment and spread of Xylella fastidiosa in NENA countries ***Thaer Yaseen****, Michele Digiaro, Khaled Djelouah, Hamid El Bilali, Gianluigi Cardone*	
16:00 - 16:30	**COFFEE BREAK & POSTER SESSION I**		

16:30-17:30	**Molecular pathogen-host interactions - Session B** **Chair:** Panagiotis Sarris & Epaminondas Paplomatas **Room:** Panorama	**ASPP-Session B** **Chair:** Khaled Makkouk **Room:** Megaron C
	Bacillus velezensis K165 mediated resistance against Verticillium dahliae, Botrytis cinerea and Hyaloperonospora arabidopsidis and the role of histone acetyltransferases in biocontrol ***Danai Gkizi**, Marius Malai, Korina Douka, Eirini Poulaki, Vardis Ntoukakis, Sotiris Tjamos*	Fusarium head blight and crown rot diseases of wheat in Algeria and other southern Mediterranean countries: distribution, identification and pathogenicity of associated species ***Houda Boureghda***
	Enriched epigenetic marks at Pm-0 locus genes prime courgette and induce SAR responses against the causing agent of powdery mildew ***Theoni Margaritopoulou**, Dimosthenis Kizis, Dimitris Kotopoulis, Ioannis Papadakis, Christos Anagnostopoulos, Eirini Baira, Aikaterini Termentzi, Katialena Vichou, Carlo Leifert, Emilia Markellou*	Evaluation of the susceptibility of improved and landrace durum wheat genotypes to Zymoseptoria tritici under nitrogen supply ***Marwa Hassine**, Sawsen Ayadi*
	Keynote Talk **Genome editing: Enabling genome editing for European agriculture: will scientific evidence prevail?** ***Dirk Inze***	Determination of antibiotic residues in the endemic spurge honey (Euphorbia Resinifera o. Berg) from Morocco using biochip multi array technology and LC-MS/MS ***Rania Benjamaa**, Abdel Khalid Essamadi, Abdelkarim Moujanni, Boubker Nasser*
18:00 - 19:30	**MPU General Assembly** **Room:** Panorama	

9:00 - 9:30

Keynote Talk

The plant inside as a diverse microhabitat: communities, niches, colonization behaviour of beneficial endophytes and relation to plant growth and health

Stéphane Compant

Room: Panorama

9:30 - 10:30

Xylella fastidiosa research in Europe

Chair: Loukas Kanetis

Room: Panorama

Keynote Talk

Current situation of Xylella fastidiosa impact in Spain: Main research initiatives ongoing to understand and tackle this pathogen

Blanca B Landa

Keynote Talk

The sanitary crisis caused by Xylella fastidiosa, a plant pathogenic bacterium recently discovered in Europe with a focus on the situation in France.

Marie-Agnès Jacques, *Enora Dupas, Sophie Cesbron*

Biocontrol, natural compounds and plant defense stimulants-Session - A

Chair: Stéphane Compant & Sotiris Tjamos

Room: Megaron C

Physiological, cellular, and molecular responses of Cucurbita pepo genotypes infected by Podosphaera xanthii and treated with Reynoutria sachalinensis plant extract.

Theoni Margaritopoulou, ***Dimosthenis Kizis****, Ioannis Theologidis, Aikaterini Termentzi, Eirini Baira, Manousos Makridakis, Jerome Zoidakis, Nikolaos Vakirlis, Eleftheria Toufexi, George Balayiannis, Christos Anagnostopoulos, Aikaterini - Eleni Vichou, Leonidas Rempelos, Carlo Leifert, Emilia Markellou*

Bacterial mixtures - Combining compatible endophytic Bacillus strains with strong biological control potential in vitro and ex vivo.

Polina Tsalgatidou*, Eirini-Evangelia Thomloudi, Eirini Baira, Panagiotis Katinakis,* ***Anastasia Venieraki***

The effect of volatile organic compounds emited by the biocontrol agent Paenibacillus alvei K165 grown on Luria Broth medium against Verticillium dahliae

Eirini Poulaki, Floriane L' Haridon, Réjane Carron, Laure Weisskopf, ***Sotiris Tjamos***

Valorization of Gelidium sesquipedale residue in the control of Ascochyta blight of chickpea

Hajare Errati*, Salim Lebbar, Khadija Dari, Lahoucine Hilali, Sanae Krimi Bencheqroun*

10:30 - 11:00

COFFEE BREAK & POSTER SESSION II

11:00 - 13:00	**Invasive pathogens and emerging diseases - Session A** **Chair:** Marie Agnes Jacques & Matteo Garbelotto	**Biocontrol, natural compounds and plant defense stimulants - Session B** **Chair:** Iakovos Pantelides & Anastasia Venieraki
	Potential insect vectors of Xylella fastidiosa in Morocco: case of spittlebug ***Najat Haddad**, Imane Mrabti, Mohamed Afechtal, Kaoutar El Handi, Rachid Benkirane, Moulay Chrif Smaili*	Trichoderma atroviride SC1: The biocontrol solution for grapevine pathogens and other important crops ***Maria Kaiafa**, Andrea Nesler, Jonas Goossens, Ann Vermaete*
	Modelling temperature response of Xylella fastidiosa strains and xylem vessel temperature on woody plants ***Miguel Román Écija**, Blanca B Landa, Luca Testi, Juan Antonio Navas Cortés*	Evaluation of the biocontrol capabilities of Clonostachys rosea against grapevine trunk diseases ***Adrienn Geiger**, Zoltán Karácsony, József Geml, Kálmán Zoltán Váczy*
	Spread and current situation of Fusarium oxysporum f. sp. cubense tropical race 4 affecting banana in Israel and the Middle East ***Stanley Freeman**, Marcel Maymon, Noa Sela, Uri Shpatz, Navot Galpaz*	Evaluation of biological and synthetic plant protection products for the management of Alternaria leaf blight in carrots ***Charikleia Kavroumatzi**, Maria Iliadi, Dimitra Akrivopoulou, Eirini Poulaki, Dimitris Tsitsigiannis*
	New and emerging fungal diseases of super-high-density olive trees in California. ***Florent Trouillas**, Mohamed Nouri, Renaud Travadon, Daniel Lawrence*	Evaluation of biological control agents for the protection of almond pruning wounds against fungal canker pathogens. ***Renaud Travadon**, Daniel Lawrence, Sampson Li, Florent Trouillas*
	A New Disease Complex Threatening Fig (Ficus carica L.) in Southern Italy ***Wassim Habib**, Vincenzo Cavalieri, Mariangela Carlucci, Crescenza Dongiovanni, Franco Nigro*	Mineral oils against powdery mildew: how paraffin oil induces resistance in grapevine against Erysiphe necator and how is applicable in disease management ***Xénia Pálfi**, Miklós Lovas, Zoltán Karácsony, János Kátai, Kálmán Zoltán Váczy, Zsolt Zsófi*
		Endophytic Trichoderma spp. from Hungarian grapevines with biocontrol potential *Csilla Kovács, András Csótó, Károly Pál, Antal Nagy, Erzsébet Fekete, Levente Karaffa, Christian P. Kubicek, **Erzsébet Sándor***
		Towards Nutrition-Sensitive Agriculture: an evaluation of biocontrol effects, nutritional value, and ecological impact of bacterial inoculants ***Gul-i-Rayna Shahzad**, Paola Casati, Alessandro Passera, Violetta Vacchini, Giacomo Cocetta, Antonio Ferrante, Laura Piazza, Ali Abdohllai Arpanahi*
13:00 - 14:00	**LUNCH BREAK**	

14:00 - 15:00	**Invasive pathogens and emerging diseases - Session B** **Chair:** Stanley Freeman & Kumarse Nazari **Room:** Panorama	**MPU meets the Societies** **Room:** Megaron C
	Changes in the xylem microbiota associated to infection by Xylella fastidiosa in Brazilian olive groves ***Manuel Anguita-Maeso**, Juan A. Navas-Cortés, Helvécio D. Coletta-Filho, Blanca B. Landa*	
	Etiology and management of Phytophthora crown and root rot of pistachio in California ***Florent Trouillas**, Alejandro Hernandez, Mohamed Nouri, Rosa Frias, Tyler Bourret*	
	First report of Glomerella leaf spot (GLS) in South Tyrolean (Italy) apple orchards ***Evi Deltedesco**, Jürgen Christanell, Sabine Oettl*	
	Sclerotinia sclerotiorum: A new Pathogen of Sugar Beet in the USA ***Mohamed Khan**, Md Ziaur Rahman Bhuiyan*	
15:00 - 16:30	**Integrated disease management - Session A** **Chair:** George Karaoglanidis & Mohamed Khan **Room:** Panorama	**Microbiomes and their role in plant health** **Chair:** Raina Haidar **Room:** Megaron C
	Keynote Talk: **Fungicide resistance in Botrytis cinerea populations from protected crops in the Mediterranean basin: Current status and implications with its management** ***George Karaoglanidis***	Rhizosphere-enriched microbes as a pool to design synthetic communities with beneficial effects on plant fitness and health *Maria-Dimitra Tsolakidou, Ioannis Stringlis, Natalia Fanega-Sleziak, Stella Papageorgiou, Antria Tsalakou, **Iakovos Pantelides***
	SDHI fungicide has potential to reduce storage rot in sugar beet caused by Botrytis cinerea in USA ***Mohamed Khan**, Md Ziaur Rahman Bhuiyan*	Detailed survey of fungal communities of four vineyards with different cultivars located in the Palava region (Czech Republic) ***Ales Eichmeier***
	Multilocus-sequencing–based genetic composition and DMI fungicide resistance in Erysiphe necator populations in Hungary *Márk Z. Németh, Alexandra Pintye, Orsolya Molnár, **Fruzsina Matolcsi**, Áron N. Horváth, Veronika Bókony, Zsolt Spitzmüller, Kálmán Z. Váczy, Levente Kiss, Gábor M. Kovács*	The compositional turnover of grapevine-associated plant pathogenic fungal communities are greater among intraindividual microhabitats and terroirs than among healthy and Esca-diseased plants *Adrienn Geiger, Zoltán Karácsony, Richárd Golen, Kálmán Váczy, **József Geml***
	Development of cost-effective methods for detection of the DMI fungicide resistance marker A495T of the grapevine powdery mildew fungus Erysiphe necator ***Márk Z. Németh**, Alexandra Pintye, Orsolya Molnár, Fruzsina Matolcsi, Áron N. Horváth, Zsolt Spitzmüller, Kálmán Z. Váczy, Gábor M. Kovács*	Fungal-bacterial interactions in grapevine wood: consequences on plant health ***Rana Haidar**, Amira Yacoub, Stéphane Compant, Antoine Loquet, Eléonore Attard, Maria Chrysovergi, Rémy Guyoneaud, Patrice Rey*
	Role of early-season control on Botrytis bunch rot epidemics in vineyards *Giorgia Fedele, **Valeria Altieri** , Elisa González-Domínguez, Vittorio Ross*	
16:30 - 17:00	**COFFEE BREAK & POSTER SESSION II**	

17:00 - 18:45	Integrated Disease Management -Session B **Chair:TBA** **Room:** Panorama	Microbiome and their role in plant health **Chair:** Raina Haidar **Room:** Megaron C
	Development and evaluation of a weather-driven, mechanistic model for predicting blossom blight caused by Monilinia laxa and M. fructicola on stone fruits. ***Valeria Altieri**, Irene Salotti, Vittorio Rossi*	Characterization of endophytic Alternaria species isolated from grapevine (Vitis vinifera) shoots. ***Anna Molnár**, Dániel G. Knapp, Gergő Tóth, Imre Boldizsár, Kálmán Zoltán Váczy, Gábor M. Kovács*
	Evaluation of epiphytic grape yeasts for the control of Aspergillus carbonarius and ochratoxins in grapes ***Maria Iliadi**, Eirini Poulaki, Charikleia Kavroumatzi, Maria Varveri, Dimitris Perivolaris, Sotiris Tjamos, Epameinondas Paplomatas, Dimitris Tsitsigiannis*	Fungal diversity in necrotic wood of Prunus trees in Germany ***Ulrike Damm**, Steffen Bien*
	Modeling potential climatic suitability of olive vascular diseases in southern Spain ***Luis F Arias-Giraldo**, Blanca B Landa, Juan A. Navas-Córtes*	
	Strategic management of fungicide resistant C. beticola in sugar beet using a holistic management strategy in climate change era ***Mohamed Khan***	
	Modelling the airborne inoculum of Polystigma amygdalinum, causal agent of the red leaf blotch of almond in Catalonia, NE Spain ***Gemma Pons-Solé**, Elena Lázaro, Antonio Vicent, Jordi Luque*	
	The consequences of co-infection by Cucumber green mottle mosaic virus and Pythium species under different environmental conditions ***Omer Frenkel**, Amit Philosoph, Yigal Elad, Amnon Koren, Neta Mor, Aviv Dombrovsky*	
	A mechanistic weather-driven model for Ascochyta rabiei infection and disease development in chickpea ***Irene Salotti**, Vittorio Rossi*	

8:30 - 9:15	**Mycotoxins: prevention and control** **Chair:** Antonio Logrieco & Dimitris Tsitsigiannis **Room:** Panorama	
	Keynote Talk **From Myco-key to myco-twin: mycotoxin management along food/feed chain (30 min.)** ***Antonio Logrieco***	
	Fusarium tricinctum species complex members emerging pathogens in several crops: the case of apple *Maria Teresa Senatore, Riccardo Soldesti, Martina Calì, Eleonora Cappelletti, Michael Sulyok,* ***Antonio Prodi***	
9:15-10:30	**Wood diseases in fruit crops - Session A** **Chair:** Vladimiro Guarnacia & Laura Mugnai **Room:** Panorama	
	Keynote Talk **Fungal pathogens of wood: are they a threat to Mediterranean fruit crops? (30 min.)** ***Vladimiro Guarnaccia***	
	Fungal pathogens associated with grapevine trunk diseases in Cyprus ***Loukas Kanetis****, Georgios Makris, Solonas Solonos, Marios Christodoulou, Michalis Christoforou*	
	In vitro effects of cell density on development and metabolism of Phaeomoniella chlamydospra a pathogen of Esca disease of grapevine ***Zoltán Karácsony****, Kálmán Zoltán Váczy*	
	Etiology and management of trunk and scaffold canker diseases of almond in California *Leslie Holland,* ***Florent Trouillas****, Mohamed Nouri, Daniel Lawrence, Renaud Travadon*	
10:30 - 11:00	**COFFEE BREAK & POSTER SESSION III**	
11:00-12:30	**Wood diseases in tree crops - Session B** **Chair:** Lukas Kanetis & Florent Trouillas **Room:** Panorama	**Workshop on Funding Opportunities** **Room:** Megaron C
	Botryosphaeriaceae species as fungal pathogens associated with olive trunk diseases in southern Italy ***Antonia Carlucci****, Francesco Lops, Maria Luisa Raimondo*	Horizon Europe *Giorgos Christou* Scientific Officer, Research and Innovation Foundation (RIF) – Cyprus
	The effect of extreme weather conditions on the incidence and spreading of grapevine trunk diseases ***András Csótó****, Péter Balling, Nándor Rakonczás, Antal Nagy, Csilla Kovács, Erzsébet Sándor*	ERC Funding Programs *Alessandra Ferrari* Research Programme Agent, European Research Council Executive Agency (ERC) – Brussels
		COST Katerina Karakasidou Scientific Officer, Research and Innovation Foundation (RIF) – Cyprus
	Exploration of non-enzymatic wood degradation pathway in Fomitiporia mediterranea, the historical Esca agent ***Samuele Moretti****, Mary-Lorène GODDARD, Jacques Lalevée, Stefano Di Marco, Laura Mugnai, Christophe Bertsch, Sibylle Farine*	LIFE PROGRAMME *Marilena Papastavrou* National Contact Point LIFE Programme, Department of Environment, Ministry Of Agriculture - Cyprus
		European Food Safety Authority - EFSA *Georgios Stavroulakis* National Focal Point EFSA, State General Laboratory – Cyprus
		Erasmus+ Q&A

	Induction of grapevine defence mechanisms by the oomycete Pythium oligandrum against, Neofusicoccum parvum, a pathogenic fungus involved in Esca ***Amira Yacoub**, Rana Haidar, Jonathan Gerbore, Marie Cécile Dufour, Patrice Rey*
	Structure analysis of the ribosomal intergenic spacer (IGS) region as a putative marker for Phaeoacremonium phylogeny ***Maria Luisa Raimondo,** Francesco Lops, Antonia Carlucci*
12:30 - 13:00	**Abiotic stresses** **Chair:** Epaminondas Paplomatas **Room:** Panorama
	Keynote Talk **Plant and seed priming for improved growth and abiotic stress protection under a changing climate** ***Vassilis Fotopoulos***
13:00 - 14:15	**LUNCH BREAK**
14:15 -14:45	**Forest Pathology: Cypress canker** **Chair:** Dimitris Tsitsigiannis **Room:** Panorama
	Keynote Talk **Cypress Canker: a model pathosystem to study fungal invasions** ***Matteo Garbelotto***
14:45-16:15	**Smart and Precision Plant Pathology** **Room:** Panorama
	Keynote Talk **Innovative Smart Technologies for Agricultural Production and Plant Health** **Tito Caffi**
	Keynote Talk **Integrated pest management smart technologies to precisely detect and control plant diseases** ***Dimitris Tsitsigiannis***
	Keynote Talk **Applications of remote sensing and information technology in the surveillance of quarantine diseases of fruit tree crops** ***Anna Maria D'Onghia***
16:15 - 16:30	**COFFEE BREAK & POSTER SESSION III**
16:30 - 18:15	**Biopesticides & Biostimulants: New insights, innovation and commercialization** Chair: Laura Mugnai **Room:** Panorama
18:15 - 21:00	**TOUR & CONFERENCE DINNER**

Study Trip and Sightseeing

POSTERS LIST

Poster Session Tuesday, 05 April 2022

- Pathogenesis-related proteins of *Arabidopsis thaliana* in response to combination of abiotic (salinity) and biotic (fungus gnats and dodder) stresses
  Lyuben Zagorchev, Denitsa Teofanova, Kristiyana Georgieva, Alexandra Atanassova
- Genome-wide characterization of WD40 protein family in *Monilinia fructigena*
  Antonios Zambounis, Aliki Xanthopoulou
- RNA sequencing-based transcriptional profiling of kiwifruit during infection by *Botrytis cinerea*
  Antonios Zambounis, Ioannis Ganopoulos, Dimitrios Valasiadis, Lefkothea Karapetsi, Panagiotis Madesis
- Infection and colonization of grapevine propagation material by pathogens associated with young grapevine decline in Greece
  Christos Tsoukas, Aliki Tzima, Alexandra Triantafyllopoulou, Epaminondas Paplomatas
- Investigation of the disease-associated role, cellular localization and secretion of the thermo unstable translation elongation factor (Ef-tu) encoded by the vascular wilt fungus *Verticillium dahliae*
  Georgios Patsis, Alexandra Triantafyllopoulou, Danai Gkizi, Seogchan Kang, Aliki Tzima, Epameinondas Paplomatas
- Bactrocera oleae as a transmitting agent of olive drupes anthracnose caused by *Colletotrichum acutatum*.
  Polyxeni Adami, Panagiota Velaeti, Christos Tsoukas, Sofia Dervisoglou, Epameinondas Paplomatas, Dionysios Perdikis
- Manipulation of ACC (1-aminocyclopropane-1-carboxylic acid) deaminase gene in *Verticillium dahliae* revealed a binary role for ACC in regulating virulence and plant defense: two sides of the same coin
  Maria-Dimitra Tsolakidou, Iakovos Pantelides, Aliki Tzima, Seogchan Kang, Epameinondas Paplomatas, Dimitris Tsaltas
- Phenotypic and molecular responses of potato genotypes to infection by pathotype 18(T1) of *Synchytrium endobioticum* (Schilb.) Perc
  Theoni Margaritopoulou, Ioannis Theologidis, Dimosthenis Kizis, Nikos Vakirlis, Christos Kritikos, Dimitrios Tsirogiannis, Irene Vloutoglou
- BAM3 plays a significant role in host resistance against *Fusarium oxysporum*.
  Eleni Kalogeropoulou, Konstantinos Aliferis, Maira Lykogianni, Sotiris Tjamos, Irene Vloutoglou,Epameinondas Paplomatas
- Evaluation of foliar resistance of Greek wine grape varieties to downy mildew by phenotyping methods and comparative transcriptomic and proteomic analyses.
  Eleni Kalogeropoulou, Dimitrios Tsirogiannis, George Tsiolas, Dimosthenis Kizis, Eirini Baira, Ioannis Theologidis, Emmanouil Margaritis, Christos Kritikos, Petros Batakis, Anagnostis Argiriou, Emilia Markellou, Irene Vloutoglou
- Exploring the selective signatures upon LRR-containing genes towards their functional diversification… the cases of cherries and mulberries
  Antonios Zambounis, Ioannis Ganopoulos, Athanasios Tsaftaris, Panagiotis Madesis
- Genetic and structural diversity of disease resistance genes through whole genome re-sequencing of sweet cherry (*Prunus avium L.*) cultivars
  Antonios Zambounis, Ioannis Ganopoulos, Athanasios Tsaftaris, Panagiotis Madesis, Athanasios Molassiotis, Aliki Xanthopoulou
- Transcriptome analysis and gene expression profile in response to drought stress in *Citrus macrophylla* stem tissues
  Melina Silva, Patrícia Pinto, Amílcar Duarte, Susana Dandlen, Rui Guerra, Deborah Power, Natalia Marques
- Efficiency of different proactive measures in the management of Verticillium wilt of potato in Lebanon
  Farah Baroudy, Luciana Saade, Zakhia Mahfouz, Carine Saab, Elvis Gerges, Wassim Habib

Poster Session Tuesday, 05 April 2022

- Endophytic bacteria as potential biocontrol agents against *Phaeomoniella chlamydospora*, the dominant causal agent of Petri disease in grapevines
  Christos Tsoukas, Aliki Tzima, Epaminondas Paplomatas
- Monitoring of Copper persistence on Plants by Active Thermography
  Massimo Rippa, Valerio Battaglia, Michele Cermola, Pasquale Mormile, Ernesto Lahoz
- Fungicide resistance of *Botrytis* fabae population isolated from faba bean in Morocco.
  Sarra Aouzal, Silvia Toffolatti, Hajare Errati, Rachid Mentag, Hafsa Houmairi, sanae Krimi Bencheqroun
- Integrated management of *Aspergillus carbonarius* and ochratoxins in vineyards in Greece
  Maria Iliadi, christina lagogianni, Michalis Kaminiaris, Elisavet Foteini Varvouni, Maria Varveri, Eirini Poulaki, Charikleia Kavroumatzi, Emmanouil Margaritis, Konstantinos Politis, Nikolaos Mastrodimos, Adamantia Varympopi, Dimitris Tsitsigiannis
- IKOPROTECTA - Agricultural composted products as plant protection and growth regulators
  Maria Varveri, Alexandros Bakos, Panagiotis Gianniotis, Dimitris Tsitsigiannis
- Investigation of DMI-fungicides sensitivity and resistance in grape powdery mildew (*Erysiphe necator*) populations in Hungary.
  Zsolt Spitzmüller, Xénia Karácsony-Pálfi, Alexandra Pintye, Orsolya Molnár, Márk Z. Németh, Levente Kiss, Gábor M. Kovács, Kálmán Z. Váczy
- Markers of resistance to succinate dehydrogenase inhibitor fungicides in E. *necator* populations in Hungary
  Diána Seress, Fruzsina Matolcsi, Orsolya Molnár, Alexandra Pintye, Áron N. Horváth, Gábor M. Kovács, Márk Z. Németh
- Expression of Tomato spotted wilt virus genes in antisense orientation affects virus progression in *Nicotiana benthamiana*
  Vanessa Pires, Susana Dandlen, Gustavo Nolasco, Rosário Félix, Patrick Materatski, Carla Varanda, Natalia Marques

Poster Session Wednesday, 06 April 2022

- Polysaccharides and plant protection against *Verticillium dahliae.*
  Panagiotis Neofytou, Danai Gkizi, Sotiris Tjamos
- Soil solarisation and biological control of soil borne pathogens in strawberry plantations
  Andreas Tzionis, Io Kefalogianni, Iordanis Chatzipavlidis, Sotiris Tjamos
- The multiple effects of the biocontrol agent *Pseudomonas putida* Z13 against *Botrytis cinerea* in tomato fruits
  Litsa Ampntelnour, Eirini G. Poulaki, Sotirios E. Tjamos
- Characterization of rhizobacteria from Cyprus indigenous wine grape cultivars bearing antagonistic traits against grapevine trunk pathogens.
  Loukas Kanetis, Chrysostomos Oplos, Styliana Efstathiou
- A newly reported bacteriophage against *Pseudomonas syringae* pv. tomato and its plant protective activity.
  Polyxeni Papazoglou, Dimitrios Skliros, Eleni Paraskevopoulou, Danai Gkizi, Dimitrios Goumas, Sotiris Tjamos, Emmanouil Flemetakis
- Evaluation of biological and synthetic plant protection products for the management of downy mildew in grapevines
  Charikleia Kavroumatzi, Maria Iliadi, Maria Varveri, Dimitra Akrivopoulou, Dimitrios Tsitsigiannis
- Antifungal and phytotoxic properties of essential oil isolated from three spontaneous Lamiaceae species from Morocco against the main chickpea pathogens.
  Sanae Krimi Bencheqroun, Amal Ennouri, Abdeslam Lamiri
- Effects of the leafy liverwort extract on plant pathogenic fungi causing olive fruit rot and gray mold of strawberry
  Jelena Latinovic, Marko Sabovljevic, Milorad Vujičić, Nedeljko Latinović, Aneta Sabovljević
- The phenolic responses in callus to the scion sanitary status and disinfectants allowed in the biological grapevine nurseries in Slovenia
  Denis Rusjan, Saša Gačnik, Maja Mikulič Petkovšek
- *Melia azedarach* induces the expression of marker genes involved in tomato defense responses against nematodes
  Afroditi Krokida, Dimosthenis Kizis, Maria Samara, Nikoletta Ntalli
- In vitro and in vivo antifungal properties of Thymol against *Ascochyta rabiei*
  Fatima Zahrae Ibn el Mokhtar, Hajare Errati, Hafsa Houmairi, Sanae Krimi Bencheqroun
- Antifungal and phytotoxic properties of essential oil isolated from three spontaneous Lamiaceae species from Morocco against the main chickpea pathogens.
  Sanae Krimi Bencheqroun, Amal Ennouri, Lamyae Et-tazy, Hajare Errati, Abdeslam Lamiri
- Potential of different microbial agents for biocontrol of early blight disease of potato and tomato
  Zarko Ivanovic, Tijana Zivkovic, Danica Zezelj
- BIOVEXO, a BBI-JU-H2020 project on biocontrol of Xylella and its vector in olive trees for integrated pest management
  Stéphane Compant

Poster Session Wednesday, 06 April 2022

- An emerging threat to chestnut nuts: *Gnomoniopsis castanea* in the Northern Apennines
  Edoardo Scali, Chiara Aglietti, Luisa Ghelardini, Paolo Capretti, Alessandro Guidotto, Sara Pini
- Wheat rusts monitoring in Tuscany and Sicily: re-emergence of stem rust on both durum and common wheat cultivars
  Marco Nocentini, Laura Mugnai, Biagio Randazzo, Mogens Støvring Hovmøller, Mehran Patpour, Annemarie Fejer Justesen
- Diversity of dangerous fungal and fungus-like pathogens of fruit and berry crops in Russia
  Yulia Tsvetkova, Dmitriy Shukhin, Ana Kuznetcova
- Characterization and distribution of *Pseudomonas syringae* pv. *syrinae* on wheat in Syria
  Mohammad Kassem, Nader Asaad, Safaa Kumari, Abdul Rahman Moukahel
- Diatrype stigma and D. *whitmanensis* associated with canker and dieback of Russian olive (*Elaeagnus angustifolia* L.) trees in Iran.
  Fatemeh Ahmadyousefi- Sarhadi, Hamid Mohammadi, Saleh Panahandeh
- Identification of *Venturia asperata* on scab-resistant apple cultivars in South Tyrol (Italy)
  Sabine Oettl, Evi Deltedesco
- Occurrence of Monilinia species in South Tyrolean (Italy) sweet cherry orchards
  Urban Spitaler, Anna Pfeifer, Sabine Hauptkorn, Evi Deltedesco, Sabine Oettl
- Chemical management of *Colletotrichum acutatum* causing olive anthracnose
  Maria Varveri, Maria Iliadi, Charikleia Kavroumatzi, Dimitrios Tsitsigiannis
- Fungicide sensitivity and genetic diversity of *Botrytis cinerea* populations from conventional and organic tomato and strawberry fields in Cyprus and Greece
  Loukas Kanetis, Georgios Makris, Nikolaos Nikoloudakis, George Karaoglanidis, Anastasios samaras
- Exploration of non-enzymatic wood degradation pathway in Fomitiporia mediterranea, the historical Esca agent. S. Moretti, M. L. Goddard, J. Lalevée, S. Di Marco, L. Mugnai, C. Bertsch And S. Farine
- Biocontrol by atoxigenic Aspergillus strains and Trichoderma spp. C. Altomare, A. Logrieco.

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- Protection of grapevine pruning wounds against natural infections by trunk disease fungi
  Rebeca Bujanda, Beatriz López-Manzanares, Sonia Ojeda, Oihane Oneka, Luis Gonzaga Santesteban,Julian Palacios, David Gramaje
- Fungal Trunk Pathogens Associated with *Juglans regia* in the Czech Republic
  Jakub Pečenka, Milan Spetik, Tomas Necas, Ivo Ondrasek, Josep Armengol, Maela Leon, Carmen Berlanas, David Gramaje, Ales Eichmeier
- Preliminary observations on the interaction among *Neocosmospora solani* (syn. *Fusarium solani*), *Neofusicoccum batangarum* and *Opuntia ficus-indica*
  Santella Burruano, Selene Giambra, Giorgio Gusella, Gaetano Conigliaro, Giuseppe Surico, Laura Mugnai
- An innovative protocol for the monitoring and onsite detection of *Erwinia amylovora* in Sicily
  Franco Valentini, Franco Santoro, Marilita Gallo, lahsen oualguirah, Anna Maria D'Onghia
- Development of reagent kits for the identification of *Candidatus Phytoplasma mali* and *Candidatus Phytoplasma* pyri using Real-time PCR
  Ida Bashkirova, Galina Bondarenko, Alexey Shvartsev, Yakov Alexeev, Sophya Blinova
- Development of an algorithm of recognition for the automatic reading of nitrocellulose membranes processed by DTBIA (Direct Tissue Blot Immunoassay)
  Stefania Gualano, Ester Pantaleo, Franco SANTORO, Dajana Frasheri, Anna Maria D'Onghia
- Phenometabolomics of olive quick decline syndrome using nuclear magnetic resonance, hyperspectral reflectance and integrative chemometrics analysis
  Franco Santoro, Ahmed Elhussein M.f.m.h., Stefania Gualano, Biagia Musio, Anna Maria D'Onghia, Vito Gallo
- Evaluation of resistance of grape varieties to *A. carbonarius* and ochratoxin contamination
  Maria Iliadi, Dimitris Tsitsigiannis
- Characterization of Alternaria species associated with black point of wheat kernels in Lebanon
  Mario Masiello, Wassim Habib, Romy El Ghorayeb, Elvis Gerges, Carine Saab, Antonella Susca, Giuseppe Meca, Juan Manuel Quiles, Antonio Francesco Logrieco, Antonio Moretti
- Cultivar-dependent differences in the phyllosphere-associated mycobiome of grapevine (*Vitis vinifera*)
  Anna Molnár, József Geml, Adrienn Geiger, Carla Mota Leal, Glodia Mantwa Kgobe, Adrienn Mária Tóth, Szabolcs Villangó, Lili Mézes, Attila Márk Czeglédi, Zsolt Zsófi
- Selecting tolerant strawberry and melon germplasm to the fungus *Macrophomina phaseolina*.
  sahar youssef, Ahmed Shalaby, Stanley Freeman
- Identification and characterization of *Fusarium solani* and *Dematophora necatrix* on hemp (*Cannabis sativa* L.) in southern Italy
  Roberto Sorrentino, Valerio Battaglia, Francesco Raimo, Domenico Cerrato, Giulio Piccirillo, Antonio Merola, Ernesto Lahoz
- Behavior characterization of durum wheat varieties to distinct strains of *Pyrenophora tritici-repentis* (Tan spot) in field and controlled conditions
  Salma Tissaoui, Amira Mougou-Hamdane, Noura Omri-Ben Youssef, Bouzid Nasraoui

Poster Session Thursday, 07 April 2022

- Effect of rootstock and viroid infection on yield and composition of peel's essential oil of the Tunisian sweet orange (*Citrus sinensis*) cv. Maltaise
  Ghaya Zouaghi, Asma Najar, Abdelkarim Aydi, Alberto Claumann, André Zibetti, Ahmed Jemmali, Fathi Moussa, Manef Abderrabba, Nadia Chammem

- Decision Support Systems to improve crop protection, productivity and sustainability: piloting and internationalization
  Matteo Ruggeri, Pierluigi Meriggi, Asterios Kartsiaflekis, Sara Elisabetta Legler

- Metagenomics analysis of fungal communities associated with postharvest diseases in pear fruits.
  Antonios Zambounis, Ioannis Ganopoulos, Panagiotis Madesis

- DNA-based comparison of plant pathogenic fungi between grapevine and wild woody Rosaceae with a focus on trunk diseases
  Luca Annamaria Lepres, József Geml, Adrienn Geiger, Zoltán Karácsony, Zoltán Kálmán Váczy, András Táncsis

- Grapevine environmental DNA provides insights into temporal succession of plant pathogenic fungi under organic and conventional management
  Carla Mota Leal, Adrienn Geiger, József Geml

Welcome Cocktail

Date: **04 April, 2022**
Time: **19:00 – 20:30**
Where: **Venue**

Welcome Cocktail is the first social gathering between all conference delegates and it will take place at the Venue Hotel. It will be a relaxing evening during which delegates will have the opportunity to talk to colleagues and peers, while enjoying local drinks and ample canapés.

The Welcome Cocktail is included in all Registration Types.

Ticket per accompanying person: **€35.00**

Tour & Conference Dinner

Date: **07 April 2022**
Time: **18:15- 22:00**
Departure Time: **18:15**
Departure From: **Venue**

We will get together at the lobby of the Venue Hotel, from where we will promptly depart in air-conditioned coaches for a city tour. A professional guide will tell us about the history of Cyprus and Limassol Town in particular. Dinner will take place at a traditional tavern serving excellent dishes of Cypriot cuisine complimented with local drinks and desserts.

The Conference Dinner is included in all Normal Registration fees.

Ticket per accompanying person or Reduces Fees participant: **€60.00**

Limassol

Limassol, a city counting centuries of history, is located between two of the most renowned ancient kingdoms of the island, Amathous at the east and Kourion at the west. “Lemessos” as it is called by locals, is the second largest urban area in Cyprus (after the capital, Nicosia) and its municipality is the most populous in the country with 235,000 inhabitants (2011 Census).

Limassol is one of the fastest growing modern metropolises in Europe. The city’s infrastructure is constantly upgraded from all aspects (way of living, public construction projects, education, etc) with the most distinct project of this sort being the Limassol Marina – an exclusive waterfront development combining elegant residences and a full service marina, with its own shopping and dining area. Also, the revamped coastline now covers a 15 kilometres distance, lined with hotels and beach bars and cafes, interspersed with eucalyptus groves and linked by a promenade popular with walkers and joggers.

In recent years Limassol has progressed as one of the largest commercial ports in the Mediterranean region and it is now considered as one of the most important centres of tourism, trade and offshore companies. The city is also the business and financial centre of Cyprus as hundreds of international shipping and financial companies have their headquarters here.

Limassol, the city of wine

It is undisputable that Limassol’s prosperity is not an achievement of nowadays. Since antiquity, Cyprus source of income has been wine, which according to testimonials was a “must” during religious events, festivals or even moments of sorrow. Wine production in Limassol has started thousands of years ago along with the vineyard plantation and, especially after 20th century, contributed in the city’s welfare, as it has become the centre of wineries.








The St. Raphael Resort – 5 *

St. Raphael Resort is located on one of the most renowned beaches in Limassol, only a short coastal drive from the lively centre of town, approximately 10 minutes away. The Larnaca International Airport is 35 minutes away, and Paphos International Airport is 55 minutes away. There are shops, restaurants and bars within walking distance and a bus stop exactly outside the hotel.

This carefully chosen, tranquil location with the calm sea at your doorstep and the town only a few moments away; has convenient access to the island's motorway. Any other coastal town, mountain village or tourist attraction is hardly more than an hour's drive away.

Accommodation

Of the 272 rooms and suites, 216 have been completely renovated and the new addition of the 56 Executive Rooms has ensured that every type of guest can find the facilities to suit him/her. All rooms are equipped with 26 inch flat-screen television with satellite, pay movies on demand and play station games, complimentary coffee and tea making facilities, direct-dial telephones, radio, safes and mini-bars.

The en-suite marble bathrooms are fitted with every amenity, while the carefully designed building allows 90% of the rooms breathtaking views over the Mediterranean Sea which one can enjoy from his/her private balcony.

General Facilities

Apart from swimming in either one of the two outdoor or one indoor pools, the hotel also has a table tennis, , two tennis courts, beach volleyball and badminton courts, workout programs, darts, French bowls, Archery, a fully equipped gymnasium with the latest equipment, sauna, steam bath, Jacuzzi, scuba diving and all types of water sports. The St. Raphael Spa also offers all types of spa treatments using Thalgo products and is open seven days a week.

The St. Raphael Resort – 5 *

Food & Beverages

Sailor's Rest Lounge Bar Restaurant: Serves an array of gourmet cuisine with fresh fish, meats and pasta.

Seashells Beach Tavern: Serves a variety of fast food, grills, salads and desserts next to the beach. Lunch only.

The Palladium: Offers international themed buffet dinners with live musical entertainment.

Octagon Restaurant: Serves American buffet breakfast, and international buffet, carvery, and salad bar for lunch.

The Phoenician Restaurant: Serves a fusion of Mediterranean and Arabic cuisine meze.

The Captain's Bar: Offers the perfect retreat while enjoying cocktail favorites.

Splash Restaurant: The perfect outdoor restaurant, offers fast food and a salad bar. Open for lunch and early dinner.

The wet and dry **Amphibion Pool Bar:** A symbol of St. Raphael Resort, all guests can swim up to the bar and order from a wide variety of drinks.

Tsanotel Hotel – 3 *

General Information

Tsanotel is located in a tourist area of Limassol, about 6 km away from the Municipal Park. Bringing a new fresh breeze to the heart of the touristic area of Limassol, Tsanotel comes to offer a totally new and unique proposition with a unique design. Tsanotel promises to offer a lovely stay with style and personal attention in all that the hotel has to offer. Guests will find a super-market and shops within minutes of the hotel.

Harmony Bay Hotel – 3 *

General Information

The Harmony Bay hotel offers its guests precious moments of relaxation by the sea, in an environment that features all the modern comforts. The Hotel is situated at the heart of a unique natural landscape and it has been recently renovated.

Poseidonia Beach Hotel – 4 *

General Information

Tsanotel is located in a tourist area of Limassol, about 6 km away from the Municipal Park. Bringing a new fresh breeze to the heart of the touristic area of Limassol, Tsanotel comes to offer a totally new and unique proposition with a unique design. Tsanotel promises to offer a lovely stay with style and personal attention in all that the hotel has to offer. Guests will find a supermarket and shops within minutes of the hotel.

HORT@
From research to field

Spin Off di
UNIVERSITÀ CATTOLICA del Sacro Cuore

WHO WE ARE

Hort@ S.r.l. is a spin-off of the Università Cattolica del Sacro Cuore of Piacenza (Italy) that provides highly-specialised services to the agricultural and agri-industrial sectors, since 2008.
We currently apply the results of research in the agri-food sector by:

- transferring technological innovations to national and international production systems, for intensive and extensive farming, agro-energy crops, quality brands, and agri-food production chains, with particular attention to productivity, environmental sustainability and food safety
- carrying out trials to test agricultural inputs (seeds, phytosanitary products, fertilisers, etc) to optimize their use and increase sustainability of cropping systems.

We are also involved in different European Projects:

AGRESTIC | IWMPRAISE | SOIL4 WINE | INNOVAR

PLOUTOS | MED-GOLD | LAB 4 SUPPLY | NOVATERRA

WHAT WE DO

Our core business is to design, develop and implement Decision Support Systems, IT platforms that gather crop data in real time via sensors and scouting tools. These data are organized in cloud systems, interpreted using advanced modelling techniques and big data, and automatically integrated to produce information, alarms and support for decisions. They are available for different crops such as grapevine, olive, cereals, horticultural, legumes and industrial crops.

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Plants (ISSN 2223-7747) is an international and multidisciplinary scientific open access journal that covers all key areas of plant science. It publishes review articles, regular research articles, communications, and short notes in the fields of structural, functional and experimental botany. In addition to fundamental disciplines such as morphology, systematics, physiology and ecology of plants, the journal welcomes all types of articles in the field of applied plant science.

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