



SIXTH FRAMEWORK PROGRAMME



EuroMedCitrusNet:

**“Safe and High Quality Supply Chains and Networks for the Citrus Industry
between Mediterranean Partner Countries and Europe”**

Project Proposals and Network Sustainability

Project No. 43146

Agadir, October 2008



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- Introduction
- Preliminary Project Proposals
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Proposals based on survey findings and discussion among partners

Severe environmental Stress and new Threats

Strong need for applied research

Interest for international collaboration from main stakeholders

Build on existing research programs involving Euro Med countries

Proposed projects focused on securing market access and improved competitiveness



Project topics

- Training, Information Provision and Networking for Knowledge Exchange and Technology Transfer to Improve Citrus Quality and Safety in the Mediterranean area
- Rootstock Selection for Tolerance to Abiotic and Biotic Stresses;
- Variety Breeding for Improved Adaptation to Semi-arid conditions;
- Integrated Crop Management for Sustainable Citrus Production;
- Integrated Management of Actual and Potential Fruit Flies of Economic Importance for European and Mediterranean Citriculture;
- Marketing, Supply Chain Management and Quality Systems.



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Project title:

**Training, Information Provision and
Networking for Knowledge Exchange
and Technology Transfer to Improve
Citrus Quality and Safety in the
Mediterranean area**



Context

- According to the respondents of the EuroMedCitrusNet Needs Assessment Survey, some of the main needs of the citrus sector are for:
- R&D for improving citrus quality and safety;
- Improvement in the link between researchers and industry of the citrus sector to facilitate dissemination of new knowledge and technology transfer;
- Training on techniques and technologies used along the citrus supply chain;
- Quality information related to new knowledge or innovative technology to be made available to the grower, the technician, the packer and the marketer.



Scope

- To provide a sustainable network for the Mediterranean citrus sector linking researchers and industry and focusing on the provision of activities of knowledge and technology transfer for improving citrus quality and safety.
- Creating opportunities for contact between university/research centers and industry specialists:
 - Tools of support to the establishment and strengthening of collaborations related to knowledge and technology transfer;
 - International events related to knowledge exchange and technology transfer;
 - Training to transfer knowledge and technology in priority areas.



Methodology

1. Tools of support

- A database of relevant organizations and their expertise to strengthen collaboration both internationally and between industry and research institutions to support researchers and industry in building partnerships.
- The production and distribution of dissemination materials to publicise events, training or tools of support for the establishment and strengthening of collaborations between industry and research organizations for knowledge exchange and technology transfer
- Elaboration and provision of an online publication archive to improve dissemination of R&DI results. This would benefit less developed nations in particular where access to publications is more restricted.



Methodology

2. International Events

- To define training programmes or research agendas;
- To disseminate new knowledge or innovative technology;
- Match-making /information sessions on research funding programs,

3. Training

- Key areas: variety and rootstock selection; pest and disease control; irrigation technology; post harvest aspects; traceability, supply chain management, quality standards and consumer safety, and processing.
- Developed through collaboration between industry and researchers



Expertise Required

- Citrus sector related researchers/ industry with an interest in international collaboration
- In particular industry organization active participation will be promoted and supported within the project.
- Specific expertise in the construction of publication archives, databases, as well as the development and implementation of training courses.



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Project title:

Rootstock Selection for Tolerance to Abiotic and Biotic Stresses



EuroMedCitrusNet
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Context

- The Mediterranean citrus industry is facing biotic and abiotic stress combinations.
- Some of the adverse effects of these factors can be overcome through selecting favorable rootstocks.
- Sour orange rootstock widespread in the Mediterranean basin has sufficient tolerance against salinity and alkalinity.
- However, sour orange rootstock is sensitive to CTV. Vector of this disease is spreading very fast in the region.
- This rootstock will be out of use in a near future due to this disease.
- On the other hand, finding new citrus rootstocks is becoming an absolute necessity due to increasing adverse effects of other restricting biotic factors (such as *Phytophthora*, Mal secco, nematodes) and abiotic factors (such as drought, frost, salinity).



Scope

- Builds on work conducted under the project CIBEWU using modern breeding strategies: sexual recombination and somatic hybridisation to combine physiological, genomic, genetic and biotechnological approaches.
- Focus on tolerance to the major biotic threat, CTV, and the abiotic stresses associated with water and temperature
- 5 year project aiming at
 - Determining tolerances of citrus genetic resources against the biotic and abiotic stresses at a regional level in order to find suitable genitors.
 - Developing rootstocks by breeding methods and test them regarding tolerance to the abiotic stresses and biotic factors.
 - Further development of computerised database system to manage the citrus rootstock evaluation network.



Methodology

- 1. Local germplasm evaluation**
- 2. Physiological indicators**
- 3. Search for candidate genes and study of their physical distribution on the genome**
- 4. Comparative genetic mapping and analysis of recombination at intergeneric level**
- 5. Development and optimisation of new breeding methods including Assisted Marker Selection and somatic hybridisation**
- 6. Citrus rootstock evaluation network for sharing genetic resources**
- 7. Training, demonstration and dissemination activities**



Expertise Required

- For development, testing and dissemination activities:
 - research teams with expertise in the following fields: horticulture, plant pathology, and genetic and biotechnological techniques for rootstock breeding and evaluation.
- For training, testing, demonstration, and dissemination activities fruit production companies and nurseries from the Mediterranean basin.
- Furthermore, for training and dissemination activities: organizations involved in the training of citrus sector organizations for the transfer of the knowledge and tolerant rootstocks to industry.



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Project title:

Variety Breeding for Improved Adaptation to Semi-arid conditions



Context

- Most Citrus grown in the Mediterranean Area are in Semi arid conditions;
- Specific problems of semi arid areas : water scarcity, extreme temperatures, low and erratic fruit set, small fruit size and erratic production;
- Most commercial varieties originate from subtropical humid areas: less adaptation to dry zones;
- Citrus production in semiarid zones is mostly destined to fresh consumption : high quality , size , easy to peel
- Need for specific research addressing the conditions of semiarid zones with emphasis on high internal as well as external quality.



Scope

- To address the need for adaptation of varieties to Abiotic stresses (in particular semi-arid conditions such as heat, drought ...)
- 5 year project aiming at developing, testing, and transferring to industry orange and mandarin/Clementine varieties with improved resistance to stress conditions.



Methodology /Expertise

- Similar expertise and methodology to the previous proposal
- Necessity to survey and assess areas of the Mediterranean where the various stresses are localized and determine signs of tolerance.
- Necessity to delimit the geographical zones and regions where the various stresses prevail; assess varieties used in those areas; use and develop markers of stress tolerance.



Methodology /Expertise

- Mutation detection and conventional breeding are the most commonly employed methods for variety breeding.
- Use of the latest biotechnological tools to speed the breeding process
- Select participating commercial growers to transfer new cultivars and test market acceptance



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Project title

Integrated Crop Management for Sustainable Citrus Production



Context /Scope

- Employment of improved orchard management techniques can lead to significant improvements in quality and safety of citrus fruit
 - Reducing application of chemical sprays and consequent associated risks to human health and the environment.
 - Increasing the sustainability of citrus production
- Aim at improving low input and organic practices in the areas of: soil management / fertilisation; irrigation / fertigation; fruit set, pruning; weed management.
- Focus on new commercially important varieties which favour ICM such as the Navel group.
- Exclude integrated protection against pests and diseases (IPM) and post harvest practices.



Methodology

- 1. Soil management / fertilization - improved methods of production and use of compost, other organic matter, beneficial micro-organisms**
- 2. Irrigation / fertigation - optimum nutrient, irrigation water quality /quantity**
- 3. Fruit set and pruning - effective methods for fruit set (chemicals, use of pollinators, pruning...) and pruning (type, season, tree development stage, extent) as well as canopy management**
- 4. Weed management and Intercropping - cover crops, intercropping, optimum methods (mechanical, chemical, ...), modes of action**
- 5. Life-cycle analysis - data collected in work packages 1 to 4 and other socio-economic data to assess sustainability**
- 6. Demonstration, training and dissemination**



Expertise Required

- Research expertise: soil management / fertilisation; irrigation / fertigation; fruit set, pruning; weed management; and life-cycle analysis.
- Researchers should have good relationships with citrus sector growers and training organizations for the facilitation of the experimentation and subsequent transfer of the knowledge and techniques to the main beneficiaries.
- In terms of industry, growers (in particular SMEs as this is representative of citrus sector enterprises) with orchards at least 10- 15 hectares planted with the commonly used newer variety types
- Organizations providing training to the citrus sector and with the ability to disseminate the project's results to industry



SIXTH FRAMEWORK PROGRAMME



Project title:

**Integrated Management of Actual and
Potential Fruit Flies of Economic
Importance for European and
Mediterranean Citriculture**



Context /Scope

- A deeper understanding of the major disease and pest constraints on Mediterranean citrus is required to allow the development of integrated and sustainable orchard systems
- Fruit flies (of which Med Fly is the most common in the Mediterranean area) are currently one of the most difficult pests to manage in the Mediterranean
- Currently mainly controlled using insecticides for which there are distinct two disadvantages – increasing resistance and the environmental and human health impact.
- Project to increase understanding of biology (genetic structure and mating behaviour), further develop and compare control methods such as the Sterile Insect Release Technique, chemosterilization, Attract & Kill type techniques, biological control methods...and consideration of regulatory issues.



Methodology

- 1. Genetic Structure Studies**
- 2. SIT**
- 3. Chemosterilisation**
- 4. Attract and Kill**
- 5. Biological Control Methods**
- 6. Other techniques**
- 7. Regulatory issues**
- 8. Life-cycle analysis**
- 9. Demonstration, training and dissemination**



Expertise Required

- Research expertise: horticulturists, geneticists, plant pathologists, entomologists, risk assessment (particularly associated to the genetic studies) and life-cycle analysis expertise to assess the sustainability of the various techniques for Med Fly control as well as expertise in regulatory issues.
- The project would also benefit from input from Latin America such as Mexico, for example where there are researchers with high competence on fruit flies.
- Industry, growers with a range of growing conditions (in particular those most suited to Med Fly).
- Organizations managing or providing training to the citrus sector.



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Project title:

Marketing, Supply Chain Management and Quality Systems



Context /Scope

- Ever greater distances from original production to customer and associated logistics, traceability, quality assurance, marketing, and economics issues.
- Industry indicates a lack of support to sales and marketing as a key constraint to international sales.

Project to:

- Determine ways to improve quality control monitoring along the chain as well as information circulation and dissemination;
- Examine the effects of negotiation on competitiveness and quality;
- Identify barriers to market access, new business opportunities, alternative marketing venues to minimize transactions costs.



Methodology

1. Upgrading supply chain of citrus in Mediterranean basin

Study of the logistics organization, communication aspects such as publicity, promotion etc., transportation, concentration and association of producers

2. Vertical integration

Study of the organisation of the citrus industry, the association among Mediterranean citrus operators, and the coordination and collaboration between them with the view to developing a long-term marketing strategy.

3. Implementing quality and safety systems

Economic factors and impacts, Social impacts, environmental impacts



Expertise Required

- Organizations from both private and public sectors involved in the citrus supply chain between the Mediterranean and the EU including certification organisms
- Research expertise in the fields such as supply chain management, logistics, marketing and economics in particular with a knowledge of the citrus sector and its supply chain between Mediterranean countries and the EU.



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Ideas for Network sustainability



- The funding of the first proposal presented would allow further continuation of the network and ensure:
- A connecting organization for research activities to promote Mediterranean Citrus quality and safety (projects presented today, and other Mediterranean research activity);
- Greater presence on the Internet



- Convince stakeholders from both shores of the Mediterranean that we have common future
- Promote and improve the image of EuroMed fruits
- Support the prevention of potentially destructive pests from entering the EuroMed Zone and spreading to all countries



- Improve knowledge of on Good Agricultural Practices (including general public);
- Disseminate success stories of GAP (ex: SIT programs in the Mediterranean);
- Organize training sessions with participants from the area.