

# ***COST***

*Domain Committee "Food and Agriculture"*

## ***COST Action 863***

<p><b>Euroberry Research: from Genomics to Sustainable Production, Quality &amp; Health</b></p>
---

### ***MONITORING PROGRESS REPORT***

**Period:** from 20/01/2005 to 31/12/2006

*This Report is presented to the relevant Domain Committee and contains two parts:*

- I. Management Report** prepared by the COST Office
- II. Scientific Report** prepared by the Chair of the Management Committee of the Action

# I. Management Report

## I.A. COST Action Fact Sheet



# Action Fact Sheet

## Action 863

Euroberry Research: from Genomics to Sustainable Production, Quality & Health

Domain : Food and Agriculture

Action Web Site : <http://www.euroberry.it/>

### Action details

CSO approval date : 01/12/2004

Entry into force : 20/01/2005

End of Action : 20/04/2010

### Objectives

Berry production is an economically significant part of agriculture in most European countries. The main objective of the Action is to improve the quality and production of berries to benefit the health of the consumers and maintain profitable European production using sustainable systems.

### Signatures

Country	Date	Status	Country	Date	Status	Country	Date	Status
Austria	27/04/2005	Confirmed	Belgium	18/03/2005	Confirmed	Bulgaria	20/01/2005	Confirmed
Croatia	05/01/2005	Confirmed	Cyprus	20/01/2005	Confirmed	Czech Republic	10/02/2005	Confirmed
Denmark	28/01/2005	Confirmed	Finland	01/02/2005	Confirmed	Former Yugoslav Republic of Macedonia	16/06/2005	Confirmed
France	03/03/2005	Confirmed	Germany	18/03/2003	Confirmed	Greece	05/04/2005	Confirmed
Hungary	10/03/2005	Confirmed	Ireland	20/01/2005	Confirmed	Italy	01/02/2005	Confirmed
Latvia	05/01/2005	Confirmed	Lithuania	20/01/2005	Confirmed	Netherlands	20/01/2005	Confirmed
Norway	17/03/2005	Confirmed	Poland	20/01/2005	Confirmed	Portugal	15/04/2005	Confirmed
Romania	01/02/2005	Confirmed	Serbia	21/01/2005	Confirmed	Slovakia	20/01/2005	Confirmed
Slovenia	10/02/2005	Confirmed	Spain	21/01/2005	Confirmed	Sweden	16/01/2006	Confirmed
Switzerland	08/04/2005	Confirmed	Turkey	18/10/2005	Confirmed	United Kingdom	20/01/2005	Confirmed
Total	30							

### Intentions to sign

Israel	09/01/2007	Intention		09/12/2004	Intention
Total	2				





# Action Fact Sheet

## Action 863

Euroberry Research: from Genomics to Sustainable Production, Quality & Health

Domain : Food and Agriculture

Action Web Site : <http://www.euroberry.it/>

**Chair:**

**Title Bruno Mezzetti**

Fruit Breeding and Biotechnology

Dep. Environmental Science and Crop Production

Agriculture

Marche Polytechnic University

Via Breccia Bianche

60100 Ancona

Italy

Tel. +39 0712204933

Fax. +39 0712204856

B.MEZZETTI@UNIVPM.IT

**Rapporteur:**

**Dr. Jean-Francois Hausman**

EVA

41 Rue du Brill

4422 Belvaux

Luxembourg

Tel. +352 470261440

Fax. +352 470264

hausman@lippmann.lu

**Science Officer:**

Bouktje STOL

bstol@cost.esf.org

**Administrative Officer:**

Christophe PEETERS

cpeeters@cost.esf.org

### Working Groups

None

### Non COST Institutions

None

### Action Website

<http://www.euroberry.it/>



## I.B. Management Committee member list

First Name	Family Name	Country	Email
Margit	LAIMER	Austria	m.laimer@iam.boku.ac.at
Philip	LIETEN	Belgium	filip.lieten@proeftuin.be
Monique	BODSON	Belgium	bodson.m@fsagx.ac.be
Violeta			
Savova	KONDAKOVA	Bulgaria	violeta83@hotmail.com
Elena	TODOROVSKA	Bulgaria	elenatod@mail.bg
Boris	DURALIJA	Croatia	bduralija@agr.hr
Tomislav	JEMRIC	Croatia	tjemric@agr.hr
Damianos	NEOCLEOUS	Cyprus	d.neocleous@arinet.ari.gov.cy
Ioannis	PAPADOPOULOS	Cyprus	papado@arinet.ari.gov.cy
Josef	SPAK	Czech Republic	spak@umbr.cas.cz
Radomira	VANKOVA	Czech Republic	vankova@ueb.cas.cz
	TOLDAM-		
Torben Bo	ANDERSEN	Denmark	tbta@kvl.dk
Holger	DAUGAARD	Denmark	holger.daugaard@agrsci.dk
Päivi	PARIKKA	Finland	paivi.parikka@mtt.fi
Béatrice	DENOYES-ROTHAN	France	denoyes@bordeaux.inra.fr
Marie-			
Claude	LEMOINE	France	marie-claude.lemoine@dijon.inra.fr
Erika	KRÜGER-STEDEN	Germany	Krueger@fa-gm.de
Klaus	OLBRICHT	Germany	k.olbricht@bafz.de
Georgia	PAROUSSI	Greece	paroussi@otenet.gr
Ferenc	DÉNES	Hungary	fkut@axelero.hu
Klara	NYERGES	Hungary	nyerges.klara@fejer.ontsz.hu
Michael J.	HENNERTY	Ireland	michael.hennerty@ucd.ie
Eamon	KEHOE	Ireland	e.kehoe@wexford.teagasc.ie
Asaph	AHARONI	Israel	asaph.aharoni@weizmann.ac.il
Carlo	ROSATI	Italy	carlo.rosati@trisaia.enea.it
Bruno	MEZZETTI	Italy	B.MEZZETTI@UNIVPM.IT
Sarmite	STRAUTINA	Latvia	strautina@ddsis.lv
Audrius	SASNAUSKAS	Lithuania	a.sasnauskas@lsdi.lt
Rytis	RUGIENIUS	Lithuania	R.Rugienius@lsdi.lt
Gijs	VAN KRUISTUM	Netherlands	gijs.vankruistum@wur.nl
Bert	VAN DUIJN	Netherlands	b.vanduijn@voeding.tno.nl
Arnfinn	NES	Norway	arnfinn.nes@bioforsk.no
Rolf	NESTBY	Norway	rolf.nestby@bioforsk.no
Bozenna	BORKOWSKA	Poland	bborkow@insad.pl
Malgorzata	KORBIN	Poland	mkorbin@insad.pl
	LOPES DA		
Luis	FONSECA	Portugal	ll@mail.telepac.pt
Maria	DA GRAÇA PALHA	Portugal	gracapalha@mail.telepac.pt
Mihail	COMAN	Romania	icpp_mar@geostar.ro
Aurel	POPESCU	Romania	aurel_n_popescu@yahoo.com
			jugvocca@yu1.net;
Djurdjina	RUZIC	Serbia	ruzicdj@eunet.yu
Gabriela	LIBIAKOVA	Slovak Republic	gabriela.libiakova@savba.sk
Darinka	KORON	Slovenia	darinka.koron@kis.si
Jose			
Federico	SANCHEZ SEVILLA	Spain	jfsevilla@uma.es

Lluis	SERRA MAJEM	Spain	lserra@dcc.ulpgc.es
Birgitta	SVENSSON	Sweden	birgitta.svensson@vv.slu.se
Inger	HJALMARSSON	Sweden	inger.hjalmarsson@bredband.net
Christoph	CARLEN	Switzerland	christoph.carlen@acw.admin.ch
		The Former	
		Yugoslav	
Marjan	KIPRIJANOVSKI	Republic of	kmarjan@zf.ukim.edu.mk
Sevgi	PAYDAS	Macedonia	sevpay@cu.edu.tr
Nurettin	KASKA	Turkey	nkaska@cu.edu.tr
David	SIMPSON	Turkey	david.simpson@emr.ac.uk
Stuart	GORDON	United Kingdom	stuart.gordon@scri.ac.uk
		United Kingdom	

## I.C. Overview activities and expenditures

### Action 863

29/01/2007

### 2006 Budget

Total Action Budget

140232.00

Remaining Action Commitment

7866.42

### Meetings

Meeting Type	Date	Place	Paid part	Cost	Total
Working Group	23/02/2006	Nitra (SK)	15	11822.58	
Joint Management Committee/Working Group	19/04/2006	Zagreb (HR)	42	36286.91	
Working Group	01/09/2006	Gembloux (BE)		000.00	
Working Group	27/09/2006	Barcelona (ES)	34	32871.92	
Working Group	02/11/2006	Huelva (ES)	5	5194.35	
Working Group	22/11/2006	Ancona (IT)	10	9277.30	
Working Group	04/12/2006	Geisenheim (DE)	5	2688.27	
Working Group	11/12/2006	Brussels (BE)	6	3344.42	
Working Group	18/12/2006	Vienna (AT)	5	3504.82	
Working Group	18/12/2006	Forli (IT)	10	9443.04	
					<b>114433.61</b>

### STSM

Beneficiary	Date	From	To	Cost	Total
Dr Djurdjina Ruzic	09/10/2006	32000 Cacak (CS)	SK	1000.00	
Dr Alena Gajdosova	26/06/2006	950 07 Nitra (SK)	FI	1500.00	
Dr Anne Lemmetty	05/06/2006	Jokioinen (FI)	CZ	1000.00	
Ms Anita Herndl	09/10/2006	Vienna (AT)	IT	819.00	
Ms Sara Tulipani	01/11/2006	Ancona (IT)	NL	2000.00	
Dr Lucia Landi	19/11/2006	Ancona (IT)	GB	2000.00	
Dr Eamonn Kehoe	26/11/2006	Dublin (IE)	IT	1000.00	
Dr Serçe Sedat	16/10/2006	Hatay (TR)	IT	1400.00	
Mr Mathieu ROUSSEAU	15/10/2006	33883, Villenave d'ornon (FR)	DE	612.97	
Dr Tihomir Milicevic	13/12/2006	Zagreb (HR)	IT	1600.00	
					<b>12931.97</b>

### Workshops

Title	Date	Place	Cost	Total
WG 1 & 4 'Genetic bases for bioactive compounds affecting human health in berry fruits'	27/09/2006	Barcelona (ES)	3000.00	
				<b>3000.00</b>

**General Support Grants**

Title	Date			Cost	Total
General	01/01/2006			2000.00	
					<b>2000.00</b>

**Schools**

Title	Date	Place		Cost	Total
					<b>0</b>

**132365.58**

## 1 STATUS OF COST ACTION 863

At the moment 30 countries signed the MoU of this Action to the COST Office. Next should come also the request of the Israel national COST coordinators to sign the MoU. Experts from HORT Research, the New Zealand Agriculture research centre, also expressed the interest to join the action, in the next MC meeting will be discussed and approved the involvement of the experts from this non COST member country.

## 2 OBJECTIVE AND BENEFITS OF THE ACTION

The main objective of the Action is to improve the quality and production of four berry crops (strawberries, raspberries, currants and blueberries) to benefit health of the consumers and maintain profitable European production using sustainable systems. The new project will benefit from the experience developed on strawberry during COST Action 836 and will be extended to other berry species that are important in European countries. By using a new interdisciplinary approach the programme will focus on selected topics of major importance for the European berry production system and quality control.

The objective will be achieved by focussing on four areas of research and development:

- From genomics to variety evaluation.
- Nursery production system and plant quality control.
- Plant physiology and culture management.
- Consumer Health: components and factors affecting berry nutritional value.

The overall goal of the proposal will remain the development of a European berry production system able to assure the following attainments:

**Sustainable cropping:** growers throughout Europe need cultivars and growing systems that allow environmentally safe production that is economically viable. Nowadays, to face the globalisation of the market they strongly need to reach high standardisation for production systems.

**Quality and security:** high quality berries are required for fresh consumption and for industry. They should have a good sensory and nutritional value and consumers must be satisfied that they are safe and produced with minimum pesticide applications.

**Health benefits:** the levels of antioxidants and other bioactive compounds found in these berries should be understood. Accurate and substantiated information must be provided to consumers so that the health benefits are well understood to allow informed choices.

**Maintaining profitable production in Europe:** Berries are popular with consumers and demand within Europe is high. The threat of excessive imports from non-European countries with low labour costs must be countered by developing modern, profitable production systems. This will maintain employment in berry growing and also ensure the supply of fresh, high quality products.

The improvement of berry cultivation efficiency and increased commercial value of the fruit will help in **overcoming the labour problems** by achieving more efficient

production and meeting the expense of higher labour costs from added value. In addition, evolution of technique cultures will improve work conditions.

### **3 LIST OF WORKING GROUPS**

#### **WG1 FROM GENOME TO BERRY FRUIT**

WG leader : **Beatrice Denoyes Rothan**

3 subgroup leaders:

**1.1 Genomics and molecular methods in berry** **Beatrice Denoyes Rothan**

**1.2 Breeding and selection** **David Simpson**

**1.3 Genetic resources** **Mihail Coman**

**1.4 Variety evaluation** **Audrius Sasnauskas**

An integrated approach is required in the application of genetic and genomic technologies and the use of recombinant DNA technology will be an important tool for studies on functional genomics. The final output from all these activities is the cultivar release. An appropriate evaluation of the cultivar adaptability and quality performance in the different cultivation areas still remains the primary undertaking for a standardisation of the production systems.

The impact of new genomic approaches (molecular and biotechnology) in berry research should bring:

- a) generation of new genotypes, which are necessary for sustainable agriculture and to limit the application of pesticides and pollution of the environment.
- b) increasing breeding effectiveness by shortening the time of selection from applying knowledge of the berry genomes.

For topics 1.1 and 1.2 the subgroup leaders will work in the new integration of the work programs now active on berry genome and breeding. For topics 1.3 and 1.4 the subgroup leaders will try to give a continuation to the work already started in the previous action by identifying possibilities to better integrate national projects already acting on germplasm and variety evaluation. Particularly for variety evaluation can be expected in 2006 the organization of a SGM with the specific aim to create the berry variety evaluation network.

The WG and subgroup leaders will be responsible to provide the material for dissemination of the results via the dedicated web page, to define and propose the WG meeting program and organization, to request and evaluate the title and abstract of delegate contribution to each meeting.

#### **WG2 QUALITY ASSURANCE OF PLANTING MATERIAL**

WG leader : **Bert van Duijn**

2 subgroup leaders:

**2.1 Variety identification (the group meeting decided that this topics should be better considered in WG1 as and application of the molecular methods)**

**2.2 Plant health and diagnostics Paivi Parika**

**2.3 Plant Propagation Gina Ruzic (This was identified as a new important topic)**

**2.3 Nursery Plant management and physiological quality Bert van Duijn**

The basis for the sustainable production of high quality berries is the provision of planting material of high quality and purity. The variability of the various national standards appeared to be insufficient to solve the problems emerging on an international market. There is a need for scientific co-operation in the field of berry plant propagation techniques, quality control and certification.

Receiving diseased plants forces growers to use more and more pesticides and in consequence the risk of pesticide residues on the fruits is increased. Production of healthy plant material is strategically important in controlling many pathogens.

Expanding European berry production to different cultivation conditions and culture techniques is strictly related to the availability of a nursery production of plants with the proper quality for sustaining an efficient production.

The WG and subgroup leaders will be responsible to provide the material for dissemination of the results via the dedicated web page, to define and propose the WG meeting program and organization, to request and evaluate the title and abstract of delegate contribution to each meeting.

### **WG3 SUSTAINABLE BERRY PRODUCTION**

WG leader : **Monique Bodson**

3 subgroup leaders:

**3.1 Factors affecting plant development and differentiation Pedro Bras de Oliveira**

**3.2 Cultivation factors improving efficiency in plant productivity and berry quality Eamonn Kehoe**

**3.3 Pest and Disease Management Gijs van Kruistum**

A sound understanding of the mechanisms involved and factors affecting the production of high yields of good quality berries are essential. This requires knowledge of the physiology of the plants in different environments and ecosystems, as well as in relation to the nutritional status of the plants and pest and disease management. A research network will provide advanced knowledge, useful for the development of new sustainable cultivation systems, the adaptability to different pedo-climatic conditions for different growing systems, with the aim to fulfil the requirements of both the producers and the customers by improvement of berry production and quality, health and nutritional value of fruits. The major output should contribute to the harmonisation of product quality standards within Europe.

The WG and subgroup leaders will be responsible to provide the material for dissemination of the results via the dedicated web page, to define and propose the WG meeting program

and organization, to request and evaluate the title and abstract of delegate contributions to each meeting.

#### **WG4 BIOACTIVE COMPOUNDS OF BERRY FRUITS AFFECTING HUMAN HEALTH**

WG leader : **Margit Laimer**

- 4.1 Development and standardisation of technologies to determine the modes of action of berry derived phytochemicals; smart screens for berry crops in relation to nutritional relevance **Maurizio Battino**
- 4.2 Polyphenolics in berries – Phytochemical profiling and the relation to quality in human health **Jules Beekwilder**
- 4.3 Factors affecting bioactive compound in berry fruits and their derivatives. **Rolf Nestby**

The Action will ensure a strong integration between biochemistry and medical themes/experts and the other three working groups involved in the project. The objective of improving the nutritional value of berries can be achieved both by genetic improvement and changes in production and cultural techniques. The information available from the advanced knowledge and analytical technologies in theme 4 will facilitate these improvements through the applications of themes 1, 2 and 3. The Chairman of the Action and the WGs Chairman will assume the responsibility to strongly promote the integration and exchange between experts involved in the different research topics. In particular, experts focused on the nutrition studies should bring to all the groups an important integration of knowledge useful at different levels of research on berries: from genome and variety evaluation, to fruit characterisation and valorisation.

The WG and subgroup leaders will be responsible to provide the material for dissemination of the results via the dedicated web page, to define and propose the WG meeting program and organization, to request and evaluate the title and abstract of delegate contribution to each meeting.

#### **4 WORKING PLAN FOR THE IMPLEMENTATION OF THE COST ACTION 863**

At the kick off meeting different possibilities to manage this COST Action efficiently were discussed and some decisions were taken to reduce the costs. To focus as much as possible on research, following decisions were taken unanimously:

- Reimbursement of only one MC member per country (to be decided per meeting by the country; preferable the one who is most involved in the subject of the WG or Workshop).
- Combining MC meetings with WG meeting or Workshop.
- Management Board: chair + vice + WG leaders.
- Identification of an executive Committee (chair+vice-chair+WG leaders) that can do most of the work and request approval in writing from the MC.
- Restriction on total number of participants of WG meetings.

- To guarantee flexibility at WG meetings/workshops, only experts with specialities relating to, and ability to, contribute to the topic/s under discussion should attend each WG meeting.
- Restrict the WG meeting reimbursements to participants presenting their research strictly related to the topics identified by the meeting program.
- WG meetings will be open to all experts interested to the topics identified by the program, delegates eligible to invitation and reimbursements will be identified by the evaluation of the title and abstract (200 characters) that has to be previously submitted.
- Abstracts will be distributed to the meeting participants as printed copy and published on the web page.
- Other forms of publication and dissemination will be defined by an editorial Board: chair + vice + WG leaders.
- WG and subgroup leaders can identify interdisciplinary exchange useful to promote integration of the different expertises.
- STSM requests should be sent to the STSMs responsible (now Stuart Gordon); he, the chair and the WG leaders will serve as executive committee for the STSMs. STSM applications will be evaluated on the quality of the scientific program and of Institutions exchange. No annual deadlines for applications were fixed.
- The website of the Action will be organized and managed by the Chairman of the Action. The organization and publication of web page will be discussed within the Editorial Board.

For dividing the work, a two vice chair were unanimously chosen: Stuart Gordon and Margaret Korbin. One vice-chair should focus on STSMs (Stuart Gordon) and the other on companies by focusing on the creation of the EuroBerry Association - EBA (Margaret Korbin). In 2006 Stuart Gordon was absent for several months for some health problem, his position in 2007 will be confirmed depending on his health conditions. The same holds true also for his position as Responsible for the STSMs program.

## 5 RESULTS ACHIEVED TODATE

### ECONOMIC DIMENSION

There is production of one or more berry crops in almost all the COST countries and particularly in the **30** COST countries now actively involved in the EUROBERRY Action. From the data collected in 2001, the socio-economic importance of berries in Europe is mostly represented by strawberry, the most important berry crop, with production exceeding 1.31 million tons per year. Raspberries and currants are also widely grown in significant quantities and the former is more valuable due to a much higher proportion being sold for the high-value fresh market, as opposed to use for processing. Currants and blueberries are particularly important in Poland and Germany. Production of raspberries and blueberries, in particular, is increasing in the EU countries.

All the COST countries with significant berry production also support their industries with national research programmes, covering the spectrum from basic research to applied experimental trials. The **30** countries that signed the MoU are actively involved in berry research and it is estimated that a total of 170 career scientists are spending their time on research related to this action. Over 200 technicians and postgraduate students support

them. On the basis of national estimates provided by representatives from the **30** countries, the economic dimension of the activities carried out under the Action has been estimated, at 2003 prices, at roughly Euro 130 million in total over the four years. This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

The largest contributors of research funds are currently France, Spain, Italy, UK, Germany, Netherlands and Finland. Most of the research, in both universities and Research Institutes is publicly funded but there is also, on average, 30% private funding and considerable more in some EU countries, such as the Netherlands. The four scientific themes of this Action reflect the research topics having the highest priority in the different national research projects.

The EUROBERRY COST Action is resulting as an important tool for promoting the major integration of the different research groups and strengthening the research organization at the higher level in comparison with the other berry production areas in the world.

#### ASSESS WITH RESPECT TO OBJECTIVE

The major initial objectives of the Action were the organization of WG meetings so to get together the new experts of the different WGs. This started in 2005 with the organization of the following 3 WG meetings:

*WG2 Quality assurance of planting material*  
[Program first meeting June 2005](#)  
[COST863WG2 Abstracts Meeting 2005](#)

*WG3 Sustainable berry production*  
[Program first meeting July 2005](#)  
[Report first meeting July 2005](#)

*WG4 Bioactive compounds of berry fruits affecting human health*  
[Program first meeting April 2005](#)  
[COST863WG4 Report Meeting 2005](#)

The first 2 STSM's were also approved and the Action web page was assembled ([www.euroberry.it](http://www.euroberry.it)).

In the first half of 2006 were organized 2 meetings:

- the first WG1 meeting, held in Nitra (SK), 23-25 of February
- The WG 2 & 3 plus the first MC meeting, held in Zagreb (HR), 19 – 22 April (<http://cost.hdjv.org/>)

At this MC was better defined the plan of activities for the remaining period of the year, with the decision to give a priority to the organization of the WG 1 & 4 JM combined with the First World Congress on Human Health Nutrition, expected for late September 2006. This event resulted of particular interest for the group being the first opportunity for a direct contact with a scientific community specifically involved in human health aspects. This task

was specifically requested by the TC at the approval of the proposal. The convener of the Conference also offered the opportunity to have a section of the conference specifically dedicated to the COST action, **Session: Euroberry: factors affecting bioactive behaviour of berry fruits** Chairmen: M. Battino and Jules Beekwilder <http://www.nutrition2006.com/eng/programme.pdf>

The second major decision of the MC was to address the new budget available for promoting STSMs and also SGMs. In fact, in the last period of 2006 were organized the following 5 SGMs focused on specific topics included in the MoU:

- WG1 - Genetic Resources and variety network organization, held in Forli (IT), 18-19 December 2006
- WG1 - GMO Biosafety and berry production – in combination with the opening conference of the UNIDO international master on GMO Biosafety, held in Ancona (IT) 23-24/11/2006
- WG2 - Defining Plant Architecture, held in Huelva (SP) November 2006
- WG4- Climate influences on health beneficial components, held in Geisenheim (DE) 4-5/12/2006,
- WG4 - Analytical Methods for studying berry bioactive compounds, held in Wien 18-19/12/2006

Another SGM on the important topic of Sustainability in berry fruit sector: towards a consensus on 'Best practices recommendation' in an EU perspective was planned for early 2007:

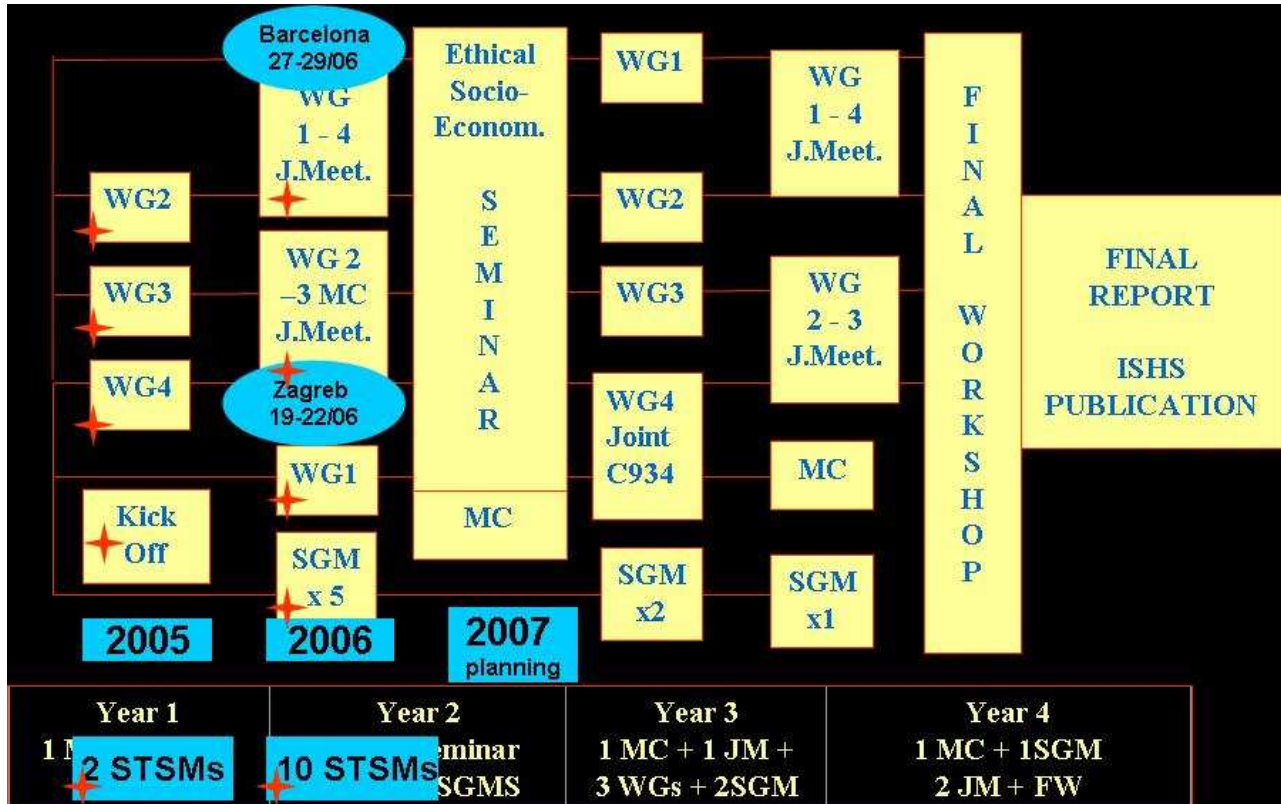
- WG3 - Pesticide rules and management for EU berry management SCRI, Dundee (UK) on Feb 5-6, 2007

Finally, really important for better defining the next year plan of activities was the Chairman and WG Leaders executive board, held in Brussels (BE), 11-12 December 2006.

All these activities were fully in line with the program included in the MoU, common important research areas were identified and also were identified common working protocols (e.g. control plant architecture; germplasm and variety evaluation; assessing the environmental impact on berry nutritional health; methods for testing berry bioactive compounds) useful for developing common research programs and applications.

## ASSESS WITH RESPECT TO ORIGINAL TIME TABLE

Following the timetable expected in the MoU with indicated the different activities already carried out. We consider to be fully in line with the original time table.



## INVOLVEMENT OF YOUNGER SCIENTISTS (STSMS)

The involvement of younger scientists was promoted mainly through the STSMs. In 2006, there were 11 applications that were all approved, of which 10 completed before December, 2006, while one (Monfort) is expected for January 2007. Another STSMs application was approved but not completed, this because addressed to Israel and this country still did not signed the MoU. In 2006 there was really a large increase in comparison with the first year of the Action (2005), when also for the budget limitation only 2 STSMs were approved. Of the total 2006 STSMs, 5 applications were submitted by experts already involved in the WG activities, while the other 6 were submitted by PhD students or young scientists. As expected this exchange allowed both to promote a tight collaboration within some groups and a training experience for some young scientists. In the discussion for 2007 budget distribution all agreed to allocate for STSMs a quite high budget.

## 6 DISSEMINATION OF RESULTS

The major dissemination activities carried out for 2006 corresponded with the abstract booklets prepared for each meeting:

- WG1 Nitra meeting abstract booklet
- WG2 & 3 JM Zagreb abstract booklet
- WG1 & 4 JM Barcelona abstract booklet
- The WG1 & 4 JM Barcelona meeting was combined with the World Congress on Public Health Nutrition and one Section of the Congress was specifically dedicated to the Activities carried out in WGs 1 and 4.

The abstracts of the four selected presentations included in this section of the congress were published in the Special issue of the Journal Public Health Nutrition. A joint paper is in preparation as outcome of the COST section organized in the Barcelona Human Health World Congress, to be published on **American J. Clin. Nutrition** (very high IF).

The most important publication, completed in 2005, was the special issue of **Biofactor**, a scientific journal in the nutrition biochemistry area with a quite good IF, including 9 papers of the WG4 members. This issue was costless and completely dedicated on the activities carried out by the group belonging to WG4. This publication resulted with a relevant impact for the entire group, for increasing berry consideration in this research area and more in general also for increasing berry consumer acceptance. Upon publication of the BioFactors paper organized by Euroberry, we have drawn attention to the health aspects of raspberry. This has been achieved through:

- interviews on Dutch national radio (prime time Radio 1 Journaal) and regional radio;
- reference to health aspects of raspberries in several Dutch newspapers, glossy magazines and television guides, and on national television;
- interviews for several international magazines, such as Natuurwetenschap en Techniek (NL) - Petra de Gunst; Gezond Nu (NL) - Raissa Luijck; Shape Magazine (USA, 2.000.000 readers) - Sharon Liao; Self Magazine (USA) - Anna Roufos / Lee Walker; Working Mother Magazine (USA) - Michele Bender; WebMD (<http://www.webmd.com/content/article/122/114560.htm>) - Elaine Magee; Natur+kosmos (Germany) - Jan Berndorff; "Integral" (Spanish) - M.T. Palomas Peix; Dagens Nyheter (Sweden)- Torill Kornfeldt; Daily Health News (USA) - Shannon McKay Carroll;
- reference in over 30 international websites;
- a full-page article in regional newspapers covering more than half of the Netherlands.

This attention in the press has almost doubled raspberry sales in the Netherlands during 2007, also significantly increased the sales of raspberry jam.

This publication was in line with the idea to promote high quality publications-dissemination for the success of our action. This is crucial for the Action and for the success of the Action, being an important aspect considered in the evaluation.

Always with the aim to promote common publications and dissemination of the Actions was decided to start the organization of a publication program as was done successfully with Biofactor, and come out the following proposals:

Margit Laimer (WG4) took the responsibility to explore the possibility to identify a list of authors and papers for proposing a special issue on **Journal of Biotechnology**, probably having the following topics:

- Tissue culture – propagation – regeneration
- Molecular tools
- Genetic modification

Monique Bodson (WG3) took the responsibility to explore the possibility to identify a list of authors and papers for a special issue on a Horticultural Journal, probably having the following topics: **Defining sustainable berry production.**

From the WG 2& 3 JM in Zagreb started also the preparation of a special issue of the ACS Journal, related to the Croatian Horticultural Society. This issue will be mostly related to specific aspects of cultivation techniques. This ACS (Agriculturae Conspectus Scientificus) berry issue will include 14 selected papers from COST 863 WG 2&3 JM and it will be published in January 2007, like Volume 71, No. 4.

Experts joining the Action also published several papers on scientific journals by mentioning the link with the COST863 action, a complete list of these related papers will be available on the webpage.

Furthermore, the major and common shared dissemination tool is the Action webpage ([www.euroberry.it](http://www.euroberry.it)), which is updated with all the information related to the different activities and reports of STSMs and SGM. This year was also opened a forum that in the next period should become a new tool of communication within the berry scientific community and external stakeholders.

#### List of related publications

1. GAJDOŠOVÁ, Alena - OSTROLUCKÁ, Mária Gabriela - LIBIAKOVÁ, Gabriela - ONDRUŠKOVÁ, Emília - ŠIMALA, Daniel: Microclonal propagation of *Vaccinium* sp. and *Rubus* sp. and detection of genetic variability in culture in vitro. *Journal of Fruit and Ornamental Plant Research* 14 (Suppl.1), 2006,
2. OSTROLUCKÁ, Mária Gabriela – GAJDOŠOVÁ, Alena - ONDRUŠKOVÁ, Emília - LIBIAKOVÁ, Gabriela: Studies in vitro regeneration ability in some *Vaccinium corymbosum* L. and *Vaccinium vitis-idaea* L. cultivars. In: Abstract book, Berry plant quality and sustainable production“ COST 863 JM WG 2&3, 19-22. April 2006, Zagreb, Croatia, p.32
3. GAJDOŠOVÁ, Alena - OSTROLUCKÁ, Mária Gabriela – ONDRUŠKOVÁ, Emília - LIBIAKOVÁ, Gabriela: Plant regeneration via adventitious organogenesis – an efficient propagation system in *Vaccinium corymbosum* L. and *Vaccinium vitis-idea* L. In: Abstract book „Berry plant quality and sustainable production“ COST 863 JM WG 2&3, 19-22. April 2006, Zagreb, Croatia, p.20

4. LIBIAKOVÁ, Gabriela – GAJDOŠOVÁ, Alena – Ostrolucká, Mária Gabriela: Effect of endogenous microbial contamination on growth and regeneration ability of *Rubus idaeus* L. In: LIBIAKOVÁ, Gabriela – GAJDOŠOVÁ, Alena (Eds.), 2006: COST 863, WG1 From genome to berry fruit, Book of
5. OSTROLUCKÁ, Mária Gabriela – GAJDOŠOVÁ, Alena – LIBIAKOVÁ, Gabriela – HRUBÍKOVÁ, Katarína – BEŽO, Milan: Protocol for micropropagation of *Vaccinium corymbosum* L. In: Protocols for Micropropagation of Woody Trees and Fruits. Kluwer, S.M.Jain and H. Haggman
6. GAJDOŠOVÁ, Alena - OSTROLUCKÁ, Mária Gabriela – LIBIAKOVÁ, Gabriela – ONDRUŠKOVÁ, Emília: Protocol for micropropagation of *Vaccinium vitis-idaea* L. In: Protocols for Micropropagation of Woody Trees and Fruits. Kluwer, S.M.Jain and H. Haggman (eds.).
7. Klamkowski K., Treder W. Morphological and physiological response of strawberry plants to water stress. 2006. *Agriculturae Conspectus Scientificus* 71 (4).
8. Spak J., Navrátil M., Karešová R., Pribylová J., Válová P., Kucerová J., Kubelková D., Fialová R., Spaková V.: Occurrence, symptom variation and yield loss caused by full blossom disease in red and white currants in the Czech Republic. *Crop protection* 25: 446-453, 2006.
9. Hanzliková-Vaňková D., Špak J., Petřík K.: Variability in sequence of Strawberry vein banding virus. *Biologia Plantarum* 50 (4) : 660-666, 2006
10. Spak, J., Kubelková, D., Pribylová, J., Spaková, V.: Graft transmission of full blossom disease in currants. Abstract book COST 863 JM and WG 2 and 3 "Berry plant quality and sustainable production 19.-22. April 2006, Zagreb, Croatia, p. 22.
11. Spak, J., Kubelková, D., Pribylová, J., Spaková, V.: Transmission of phytoplasmas associated with full blossom disease in *Ribes rubrum*. XI International Symposium on Small Fruit Virus Diseases, Antalya, Turkey May 22-26, 2006, p. 71.
12. Pribylová, J., Spak, J., Kubelková, D., Spaková, V.: Detection and Sequence Comparison of blackcurrant reversion virus in black, red and white currant. XI International Symposium on Small Fruit Virus Diseases, Antalya, Turkey May 22-26, 2006, p. 140.
13. Spak, J., Kubelková, D., Pribylová, J., Spaková, V.: Diagnostics of full blossom disease associated pathogens in certification of *Ribes* sp. Proc. of 8th Conference of the European Foundation for Plant Pathology, Copenhagen 13th - 17th of August 2006, p. 24.
14. KARHU, S.T., HYTÖNEN, T. P. 2006. Nursery plant production controlled by prohexadione-calcium and mechanical treatments in strawberry cv. 'Honeoye'. *The Journal of horticultural science and biotechnology* 81, 6 : 937-942.

ACS (Agriculturae Conspectus Scientificus) berry issue, in press

15. P. Creemers, S. Van Laer, F. Pitsioudis and P. Meesters, 2006. The control of *Botrytis cinerea* on red currants: optimising fungicide action and reducing fungicide use possible by covering the shrub. Volume 71, No. 4, in press
16. D. Ružić, T. Lazić, 2006. Micropropagation as means of rapid multiplication of newly developed blackberry and black currant cultivars. Volume 71, No. 4, in press

17. S. Milenković, D. Sretenović, 2006. Monitoring of soft fruit mother plantings aimed at control of *Phytophthora fragariae*, causal agent of the root rot. Volume 71, No. 4, in press
18. K. Klamkowski, W. Treder, 2006. Morphological and physiological responses of strawberry plants to water stress. Volume 71, No. 4, in press
19. J. Čačić, M. Tratnik, D. Čačić, D. Kovačević, 2006. Influence of different technologies on the competitiveness of strawberry production in Croatia. Volume 71, No. 4, in press
20. Lilja, P. Parikka, E. Pääskynkivi, J. Hantula, E.J. Vainio, H. Penttinen, A. Lemmetty, M. Vestberg, 2006. *Phytophthora cactorum* and *Colletotrichum acutatum*: survival and detection. Volume 71, No. 4, in press
21. Evenhuis, P.J. Wanten, 2006. Effect of polythene tunnels and cultivars on grey mould caused by *Botrytis cinerea* in organically grown strawberries. Volume 71, No. 4, in press
22. R. Steffek, A. Spornberger, J. Altenburger, 2006. Detection of microsclerotia of *Verticillium dahliae* in soil samples and prospects to reduce the inoculum potential of the fungus in the soil. Volume 71, No. 4, in press
23. Duralija, T. Miličević, A. Vokurka, A. Mešić, T. Jemrić, Z. Čmelik, 2006. Cold stored tray plants in open field cultivation of strawberries. Volume 71, No. 4, in press
24. Spornberger, R. Steffek, J. Altenburger, 2006. Testing of Early ripening strawberry varieties tolerant to soil-borne pathogens as alternative to 'Elsanta'. Volume 71, No. 4, in press
25. M. Özuygur, S. Paydaş Kargı, E. Kafkas, 2006. Investigation On Yield, Fruit Quality and Plant Characteristics of Some Local, European and American Strawberry Varieties and Their Hybrids. Volume 71, No. 4, in press
26. S. Voca B. Duralija, J. Družić Orlić, M. Skendrović, N. Dobričević, Z. Čmelik, 2006. Influence of Cultivation Systems on Physical and Chemical Composition of Strawberry Fruits cv. Elsanta. Volume 71, No. 4, in press
27. T. Milicevic, D. Ivić, B. Cvjetković, B. Duralija, 2006. Possibilities of Strawberry Integrated Disease Management in Different Cultivation Systems. Volume 71, No. 4, in press
28. G. Ondrasek, D. Romic, M. Romic, B. Duralija, I. Mustac, 2006. Strawberry growth and fruit yield in a saline environment. Volume 71, No. 4, in press
29. Ukalska J., Mądry W., Ukalski K., Masny A., Żurawicz E., 2006. Patterns of variation and correlation among traits in a strawberry germplasm collection (*Fragaria x ananassa* Duch.). *Journal of Fruit and Ornamental Plant Research*, vol. 14: 5-22
30. Żurawicz E., Masny A., Mądry W., 2006. Usefulness of selected strawberry (*Fragaria x ananassa*) genotypes for breeding late ripening cultivars. *Acta Hort.* 708: 501-505
31. Keller-Przybyłkiewicz S., Korbin M., Gwozdecki J., 2006. RAPD and ISSR markers of black and green colour of blackcurrant (*Ribes nigrum*) fruits. *Journal Of Fruit and Ornamental Plant Research* 13: 45-5.
32. Korbin M., Kuras A., Strączyńska K., Orzeł A., Danek J., 2006. Biotechnological research directions in Polish *Rubus* breeding. *Acta Hort.* in press.
33. Marzban G., Mansfeld A., Hemmer W., Stoyanova E., Katinger H. and Laimer da Câmara Machado M. 2005. Fruit cross-reactive allergens: a theme of uprising interest to consumers health. *Biofactors*. 23: 235 -241.

34. Laimer M. Allergens in small fruits: An issue for risk assessment. 1. World Congress of Public Health and Nutrition. Barcelona, Spain, September 28-30, 2006.

## EU AND NON EU SCIENTIFIC AND TECHNICAL COOPERATION

In FP6 some experts of the WGs worked together for the preparation on two proposal for FP6 (StrHea and Phenoberry), but unfortunately both had been unsuccessful. Both were conduct by members of the COST 863 action. In addition, some experts are involved in another FP6 project (FLAVO STREP project) mainly focused on looking at the flavanoid benefits of berries.

In 2006 were approved two proposals submitted in the AGRIGENRES programme: **GENBERRY** (strawberry and raspberry) proposed and coordinated by Beatrice Denoyes-Rothan, INRA France and **RIBESCO** (black currant), proposed and coordinated by Saila Karhu, MTT Agrifood Research Finland.

For the FP7 first call just published, during the SGMs organized in the last December were already identified different topics, and at least 2 proposals will be presented.

In the different meetings, experts agreed to have a system in place whereby people know if one submission has failed, just in case somebody else makes a similar proposal, and doesn't waste a lot of time and effort.

From a general discussion, all the group agreed that for the Action could be more appropriate to start also the preparation of a new theme to be submitted to the DG research so to have it approved and published in the next FP7 call for 2008 or even 2009. This would give much an opportunity to a much larger group of experts to be involved in a common project. With this aim was decided to start in writing and exchanging some ideas so to have a theme text almost ready to be discussed and submitted in the first half of the next year.

In several areas there will also be potential for collaboration with groups outside the COST Action. For example WG3 have some common interests with COST Action 842 'Biological control of pest insects and mites with special reference to Entomophthorales' and with the COST Action 838 Managing arbuscular mycorrhizal fungi for improving soil quality and plant health in agriculture; WG1 will link with tree fruit breeders who are organised in the Eucarpia Fruit Group; all WGs will interact with the ISHS Working Groups on strawberries, *Rubus/Ribes* and *Vaccinium*.

For the aspects related to nutritional aspects on berries, there are connections with other recent relevant COST programmes focused on the area of human health:

Action 916: 'Bioactive plant cell wall components in nutrition and health'

Action 924 'Enhancement and Preservation of Quality and Health Promoting Components in Fresh Fruits and Vegetables'.

Action 926: 'Impact of the new technologies on the health benefits and safety of bioactive plant compounds'.

Regarding non EU collaborations, besides the wide collaborations of all partners, a specific collaboration was started with the USDA Centre for genetic resources of Corvallis with the aim to develop an international 'strawberry genetic survey', for this activity was

asked the contribution of some members of the Action, and in particular Mihail Coman, who is responsible for the Genetic Resources Subgroup started in WG1.

#### **TRANSFER OF RESULTS AND TECHNOLOGY (EBA)**

A discussion was carried on the possibility to better promote and sustain integration in the science and technology of berry production. With this aim was proposed the formation of the 'Euroberry Association' (EBA), a consortium rather than a scientific society acting as a 'think tank'. The idea is that the COST members would start the EBA (98% of the EBA with COST (ESF) as the other 2%), then plan the sharing of the consortium with different stakeholders of the berry production chain. Still some concerns are about the legal document and about the text, particularly when it came to 'patents' and 'intellectual property rights'. However, several organizations working on small fruit in different countries expressed their interest to join this action at the different level, and this kind of support can be enlarged to other institutions at National level. To promote this idea was decided to work in getting more information on the type of organization that can be proposed and in preparing a short document to be submitted to different private institutions for presenting this initiative. The new institutions showing an interest to this initiative can be invited to the MC meeting for discussing together the potential role and type of organization. Within 2007 can be also expected a meeting specifically dedicated to starting EBA, if we will be able to accomplish all the institutional steps for involving the first public and private institutions.

#### **FUTURE PLAN**

The executive board held in Brussels last December already outlined the plan of activities for 2007 and also some for 2008, remaining in line with what originally expected in the MoU and the decision then taken by the MC:

As a priority for the first part of 2007 will be the organization of the MC MEETING AND SEMINARS ON SOCIO-ECONOMICAL IMPACT OF BERRY CULTIVATION, having the following preliminary program:

- Date: after Eastern period, eventually April 01 – 03.
- Place: France Organized at INRA, by Beatrice Denoyes, WG1 Leader.

#### **Draft Program of the MC and Seminars:**

##### Starting on Monday afternoon

- WG Leaders reports – presentation of the major topics
- Country delegates reports – we need to update the situation of berry production in EU
- General discussion on EU country productions and market
- Invite Organizations and Private Institutes and discussion – launching a larger meeting specifically addressed to the company with an interest to join EBA.

##### Thursday Morning Seminars with invited speakers

- From Zagreb an experts should prepare a presentation of berry economical impact in Balkan agricultural system.

- Any Suggestion for other economist able to present the other UE countries situation (from NL, FR or other): Marketing, certification, labelling. Ask for a report from the work done on the Biofactors paper and market reaction.
- Frank Allen IR – Social-cultural importance of Horticulture (Monique contact).
- Ask from the WG3 SGM experts, links between science reports and marketing Expert on Logistic aspects.
- Luis Sierra Majem from the Barcelona Congress could be available for developing the social health related benefits.
- Round table Discussion.

### Thursday Afternoon

MC Discussion – Planning and approval of new activities.

### Wednesday Morning

Visit to local organization.

The results of this meeting (country situation and seminars) should be published on a booklet sponsored by COST. This as preliminary proposal, any further suggestion are welcome. This meeting will be organized by the Action Chairman, the WG Leaders and the local organizer.

In the first part of 2007 will be organized also other 2 SGMs dedicated to specific topics possibly of interest for FP7 proposals, and also WG4 - COST926 JM, Siena (IT)

### **Activities for September – December**

- WG1 Kick off meeting of Genberry Dresden (DE) – SGM 8-10 experts on COST (max 3 days), Middle September.
- WG1 – WG2 JM – Genome, genetic studies and applications in breeding, biotech, physiology and variety identification (October,).
- WG3 – WG4 JM combined with the *Vaccinum* and other unknown berry Conference organized in Nitra (SK), 30 September – 3 October.
- Other STSMs 10000 Euro

### **Strategic Meetings**

For 2007 will be programmed also 2 strategic conferences, both will be not on the Action budget, but on a budget commonly share among different Actions that accept to support the interest of a conference on a specific topic commonly defined. This conference was discussed in a meeting in Brussels last December 20<sup>th</sup>, with the Chairman of 5 different COST actions and it was decided that the Microarray meeting will be organized the next 23 – 25 of May, at Sant Feliu de Guixols (ES), near Girona. The Conference will expect to invite about 120 experts and will have the following Title: **Array: Agriculture Research Results using Array Technology**. It will include the following sections:

- Introductory Section;

- Technological developments – past and future;
- Current Questions and Application Plants and forest;
- Current Questions and Application in Animal and Human;
- From proof of principle to practical applications (enlarged to Stakeholders)

From our Action will be identified some experts (2 to 5) that will be invited as speakers, eventually one as Invited lecturers.

From the WG1 SGM on GMO held in Ancona was started the idea to propose also a Strategic conference on GMO Biosafety. A preliminary proposal was prepared in collaboration with Marc De Loose, a TC Member from BE, and it was positively considered in the first LESC meeting (COST and ESF board) that approved to consider a full proposal for organizing a large meeting in 2007, enlarged also to other COST Domains, such as biotechnology, health and environment. This program will be discussed in the next COST DC Food and Agriculture meeting in Turkey, end of January 2007.

#### Integration with other International events

All agreed that COST863 should try to be integrated with other forthcoming International events related to the topic of the Action.

With this aim were identified 2 important events planned for 2008, both linked to ISHS:

- February 17-20, 2008, Wien (Austria): **I International Symposium on Horticulture in Europe**. Info: Dr. Gerard Bedlan, AGES, Spargelfeldstrasse 191, 1226 Wien, Austria. Phone: (43)5055533330, Fax: (43)5055533303, email: [gerhard.bedlan@ages.at](mailto:gerhard.bedlan@ages.at) web: [www.she2008.eu](http://www.she2008.eu)
- March 3-7, 2008, Huelva (Spain): **VI International Strawberry Symposium**. Info: Dr. José López Medina, EPS LA Rábida, 21819 Palos de la Frontera, Huelva, Spain. Phone: (34)959217522, Fax: (34)959217304 or (34)959217560, email: [medina@uhu.es](mailto:medina@uhu.es)

For both events was decided to contact the Scientific committee for proposing the organization at least of a workshop (2 Hours – 4 presentations - 15 min) specifically addressed to the major topics considered in COST863. For both events we already had a positive response.

With the aim to keep also an scientific level of dissemination, the following publication plan will be also carried out.

A joint paper is in preparation as outcome of the COST section organized in the Barcelona Human Health World Congress, to be published on **American J. Clin. Nutrition** (very high IF). A common paper is also in preparation for **J. Agri. Food Chemistry** as a proceeding of the forthcoming 2007 International Berry Healthy Benefits Symposium planned at OSU Oregon (USA) next June 2007..Now in preparation are also joint papers to be published on a special issue of **Journal of Biotechnology**.

The large contact with the public will be implemented through the web berry dedicated forum that thanks to the identification of a moderator (Eamonn Keohe) will develop different common discussion topics.

## **CONCLUSION**

The first period of activity of COST863 showed a very high level of country participation, of scientific contributions at the different group meetings, of technical and scientific exchanges promoted with the STSMs. The high scientific level was also demonstrated by the scientific publications produced by several experts. A strong integration among different scientific areas was initiated. The main difficulty of this action is the management of such a large and diverse group, however the increased budget availability of the last period offered many more opportunities of integrating the major groups. The level of budget now available is the minimum for the management of such an Action. Under these conditions we should be able during the next years of the Action to achieve several common scientific results and improve technology transfer and communication in the whole European berry production chain.

Bruno Mezzetti  
Chariman COST863