



COST

Climate Change and Forest Mitigation and Adaptation in a Polluted Environment (MAFor)

Action FP0903

Start date: 18/11/2009

End date: 31/12/2013

Year: 2

Presenter's Name

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Scientific context and objectives (1/2)

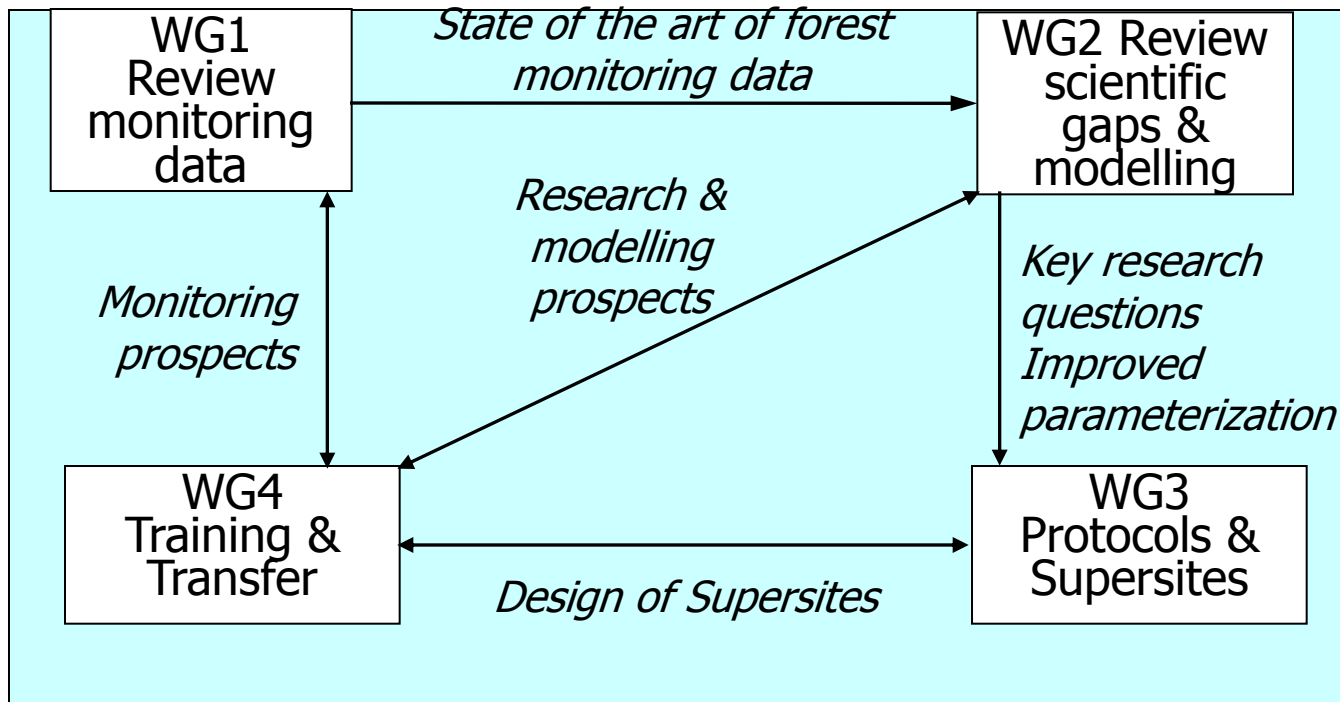
- **Background / Problem statement:** Climate change and air pollutant issues are closely linked and require more integrated research, monitoring and modelling approaches. This COST Action offers the opportunity for a significant new approach, which is the main reason of this Action, i.e. to link climate and pollution changes and impacts at forest sites. Meaningful predictions of forest adaptation to and mitigation of climate change can only be achieved when atmospheric dynamics are translated into biological effects.
- **Brief reminder of MoU objectives:** 1) to increase understanding on state and potential of forest mitigation and adaptation to climate change in a polluted environment; and 2) to reconcile process-oriented research, long-term monitoring and applied modelling at comprehensive forest research sites (Supersites)

Scientific context and objectives (2/2)

Secondary aims

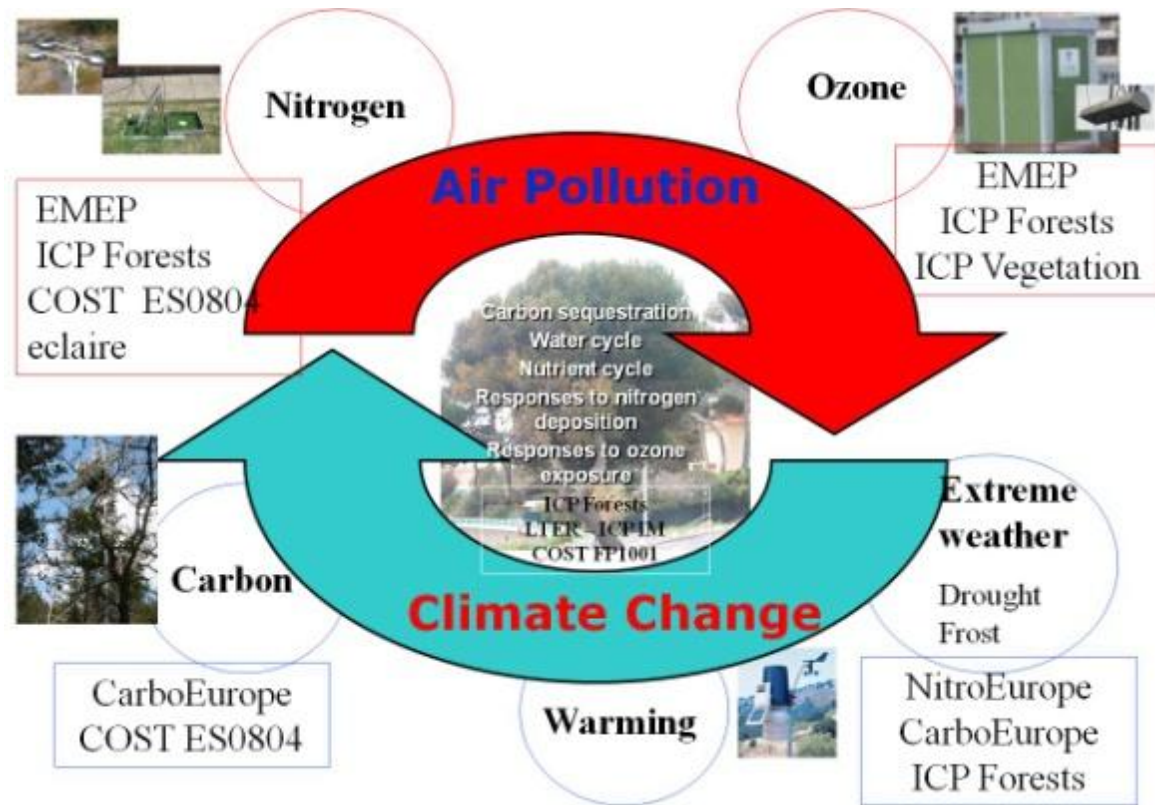
- to expand the evaluation of the presently available data;
- to identify current knowledge gaps and emerging research needs;
- to optimise the geographical distribution of Supersites and assure coverage of the most relevant ecosystems in Europe;
- to assess the value and ecological meaning of measurements and identify which measurements are a priority;
- to develop criteria and standardized protocols for data acquisition, processing, and upscaling;
- to promote and facilitate the use of the results beyond the initial targeted research communities.

Working groups



Results vs. Objectives (1/2)

- Networking.** The Action networked one further, relevant network working with air pollution, climate change and forests in Europe and got a high number of participants to the annual conference (90, Prague) and website contacts (26,128 : <http://cost-fp0903.ipp.cnr.it/>)



Results vs. Objectives (2/2)

To collate monitoring data bases from different sources. Information about accessibility of databases; intellectual property rights; possibilities for databases harmonisation; quality assurance/quality control procedures.

To identify current knowledge gaps and emerging research needs. (i) interaction between changes in air quality and climatic factors on forest ecosystem response, (ii) significance of biotic processes, (iii) tools for mechanistic and diagnostic understanding (iv) need for unifying modelling and empirical research.

To develop sites where integrated soil, plant and atmospheric research and monitoring will be carried out (Supersites). A system for forest monitoring and research in Europe was suggested.



Collection: COST Action FP0903 (2010) - Rome (Italy)

"Research, monitoring and modelling in the study of climate change and air pollution impacts on forest ecosystems"

Guest Editors: E Paoletti, J-P Tuovinen, N Clarke, G Matteucci, R Matyssek, G Wieser, R Fischer, P Cudlin, N Potocic



vol. 4, pp. 162-166 (Aug 2011)

Availability, accessibility, quality and comparability of monitoring data for European forests for use in air pollution and climate change science

Clarke N⁽¹⁾, Fischer R⁽²⁾, de Vries W⁽³⁾, Lundin L⁽⁴⁾, Papale D⁽⁵⁾, Vesala T⁽⁶⁾, Merilä P⁽⁷⁾, Matteucci G⁽⁸⁾, Mirtl M⁽⁹⁾, Simpson D⁽¹⁰⁻¹¹⁾, Paoletti E⁽¹²⁾

Environmental Pollution 160 (2012) 57–65



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journal homepage: www.elsevier.com/locate/envpol



Review

Forests under climate change and air pollution: Gaps in understanding and future directions for research

R. Matyssek^{a,*}, G. Wieser^b, C. Calfapietra^c, W. de Vries^{d,e}, P. Dizengremel^f, D. Ernst^g, Y. Jolivet^f, T.N. Mikkelsen^h, G.M.J. Mohrenⁱ, D. Le Thiec^j, J.-P. Tuovinen^k, A. Weatherall^l, E. Paoletti^m

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"Research, monitoring and modelling in the study of climate change and air pollution impacts on forest ecosystems"

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vol. 4, pp. 167-171 (Aug 2011)

Towards a transnational system of supersites for forest monitoring and research in Europe - an overview on present state and future recommendations

Fischer R⁽¹⁾, Aas W⁽²⁾, De Vries W⁽³⁾, Clarke N⁽⁴⁾, Cudlin P⁽⁵⁾, Leaver D⁽⁶⁾, Lundin L⁽⁷⁾, Matteucci G⁽⁸⁾, Matyssek R⁽⁹⁾, Mikkelsen TN⁽¹⁰⁾, Mirtl M⁽¹¹⁾, Öztürk Y⁽¹⁾, Papale D⁽¹²⁾, Potocic N⁽¹³⁾, Simpson D⁽¹⁴⁾, Tuovinen L-P⁽¹⁵⁾, Vesala T⁽¹⁶⁾, Wieser G⁽¹⁷⁾, Paoletti E⁽¹⁸⁾

Significant highlights in Science or Networking (1/3)

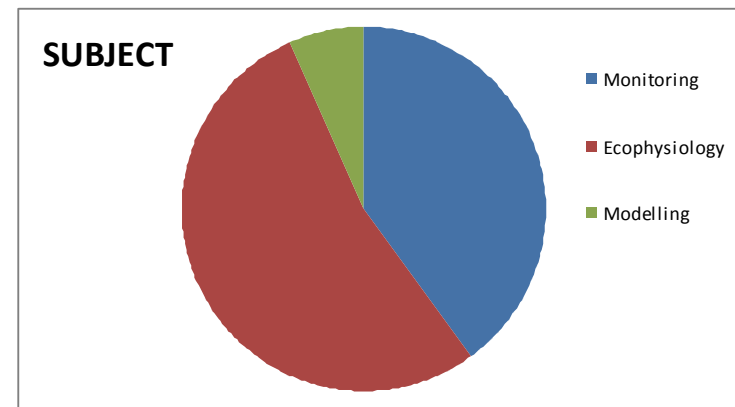
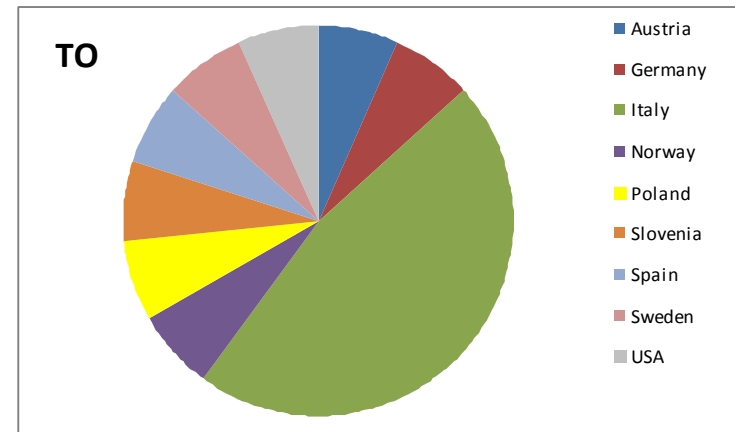
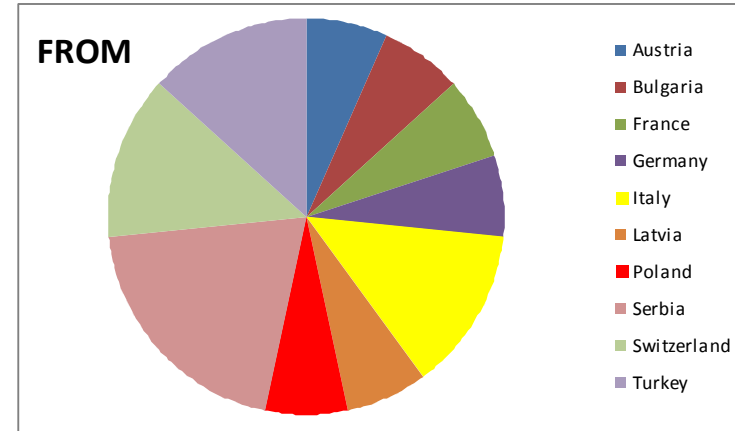
- Metadatabase, developed by STSM FP0903-8858 and available at the Action website <http://cost-fp0903.ipp.cnr.it/>
- To assist in the integration of metadata from the various European networks already dealing with air pollution, climate change and forests

PROJECT NAME	ABBREVIATION	WEB PAGE ADDRESS	DATA BASE WEB PAGE ADDRESS
Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe	EMEP	http://tarantula.nilu.no/projects/ccc/emepdata.html and online: http://ebas.nilu.no/	http://tarantula.nilu.no/projects/ccc/emepdata.html
Coordination Action Carbon Observation System	COCOS	http://www.cocos-carbon.org/	http://dataportal.cocos-project.org/
Effects of Climate Change on Air Pollution Impacts and Response Strategies for European Ecosystems	ECLAIRE	www.eclaire-fp7.eu	Not defined yet.
European Long-Term Ecosystem Research Network	LTER	http://www.lter-europe.net	https://secure.umweltbundesamt.at/eMORIS/jsp/commmon/login.jsf
Global Earth Observation and Monitoring of the Atmosphere	GEOMON	http://www.geomon.eu	http://geomon.nilu.no/ , ftp://ftp.nilu.no/pub/GEOMon/
Global Terrestrial Observing System	GTOS	http://www.fao.org/GTOS/index.html	http://www.gosic.org/ios/GTOS_observing_system.asp
Greenhouse gas management in European land use systems	GHG-Europe	http://www.ghg-europe.eu/index.php	http://www.europe-fluxdata.eu/newtcdc2/ghg-europe_home.aspx
Infrastructure for Measurements of the European Carbon Cycle	IMECC	http://imecc.ipsl.jussieu.fr/	http://www.europe-fluxdata.eu/newtcdc2/IMECC-TCDC_home.aspx
Integrated Carbon Observation System	ICOS	http://www.icos-infrastructure.eu/	Not defined yet.
Integrated non-CO ₂ greenhouse gas Observing Systems	InGOS	http://www.ingos-infrastructure.eu/	Not defined yet.
Integrated Project CarboEurope-IP Assessment of the European Terrestrial Carbon Balance	CARBOEUROPE	http://www.carboeurope.org/	http://www.europe-fluxdata.eu/imecc
International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems	ICP Integrated Monitoring	http://www.environment.fi/default.asp?contentid=17110&lan=en	-
International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests	ICP Forests	http://icp-forests.net/	http://icp-forests.net/page/plots-data
Monitoring atmospheric composition & climate	MACC	http://www.gmes-atmosphere.eu/	http://www.gmes-atmosphere.eu/data/
The nitrogen cycle and its influence on the European greenhouse gas balance	NITROEUROPE	http://www.nitroeuropa.eu/	-

CHARACTERISTICS	CARBOEUROPE
Measurement height	m
Zero plane displacement	UND
Roughness length	UND
Analyzer type / model	closed/open
Anemometer type / model	Text description
Tube diameter	mm
Tube material	Text description
Flow rate	l m ⁻¹
Linear/non linear output (LI6262)	Text description
Reference	chemicals/nitrogen
Software	Name
Spectral analysis	(Yes, No)
Averaging method	(running average, detrending etc)
Running average time constant	s
Storage CO ₂	analyzer model
Friction velocity (u*) threshold	m s ⁻¹
Monin-Obhukov length	N. A.
Momentum flux	N. A.
Covariance of U, V, W components	N. A.
Stability parameter	N. A.
Standard deviation of vertical velocity fluctuations	N. A.
Standard deviation of lateral velocity fluctuations (cross main-wind direction after coordinates rotation)	N. A.
Quality check - CO ₂ flux / footprint / sensible latent heat flux / momentum flux	N. A.
Fetch at which footprint cumulated probability is 70% / 90% / Max	N. A.

Significant highlights in Science or Networking (2/3)

- 15 STSMs (47% female scientists; 93% ESRs)
- Spin off of new EC RTD Framework Programme proposals/projects (5)
- Spin off of new National Programme proposals/projects (8)
- Activities with COST network colleagues (7) e.g. FP0905 – STSM bridging GMT and ecophysiology; FP0701 – questionnaire bridging air quality and forest fire issues



Significant highlights in Science or Networking (3/3)

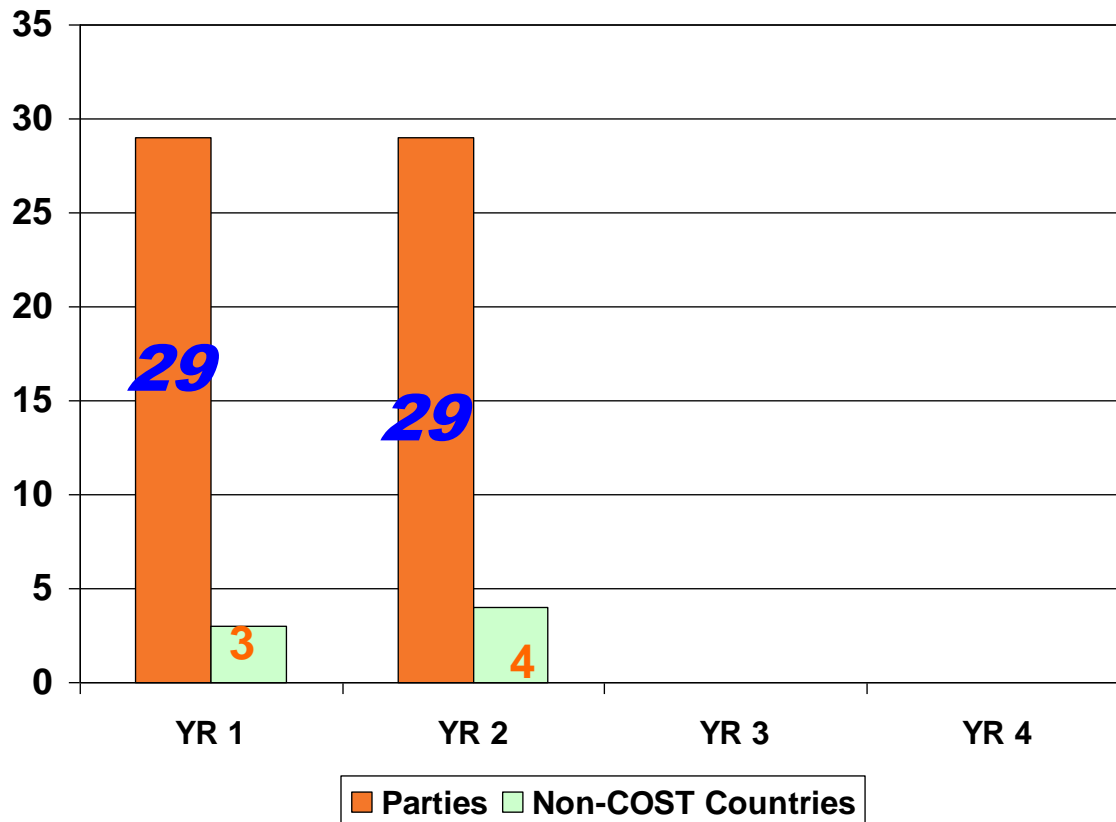
- Two joint Training Schools :
- ES0903 - “*Ecophysiological Field Techniques in Climate Change and Pollution Research*”, 5-9 September, 2011, Fondazione Mach, Monte Bondone, Trento, Italy : 19 students from 14 countries
- ES0804 – “*Flux Measurement Techniques: Methods, Sensors, Databases and Modeling*”, 11-20 September, 2011, Tuczno Castle, Poland : 45 students from 17 countries



Challenges

- No significant deviations from the scientific work plan **last year**
- Critical phase to be addressed **next year : optimisation of the geographical distribution of Supersites**. This was supposed to be done at the session 'Supersites' at the conference in Lithuania (May 2012) where main networks working with air pollution, climate change and forests will meet (IUFRO, APW, EnvEurope, ICP IM). The COST office cancelled the Action support to this conference and the session was cancelled.

Action Parties



Grant Holder:

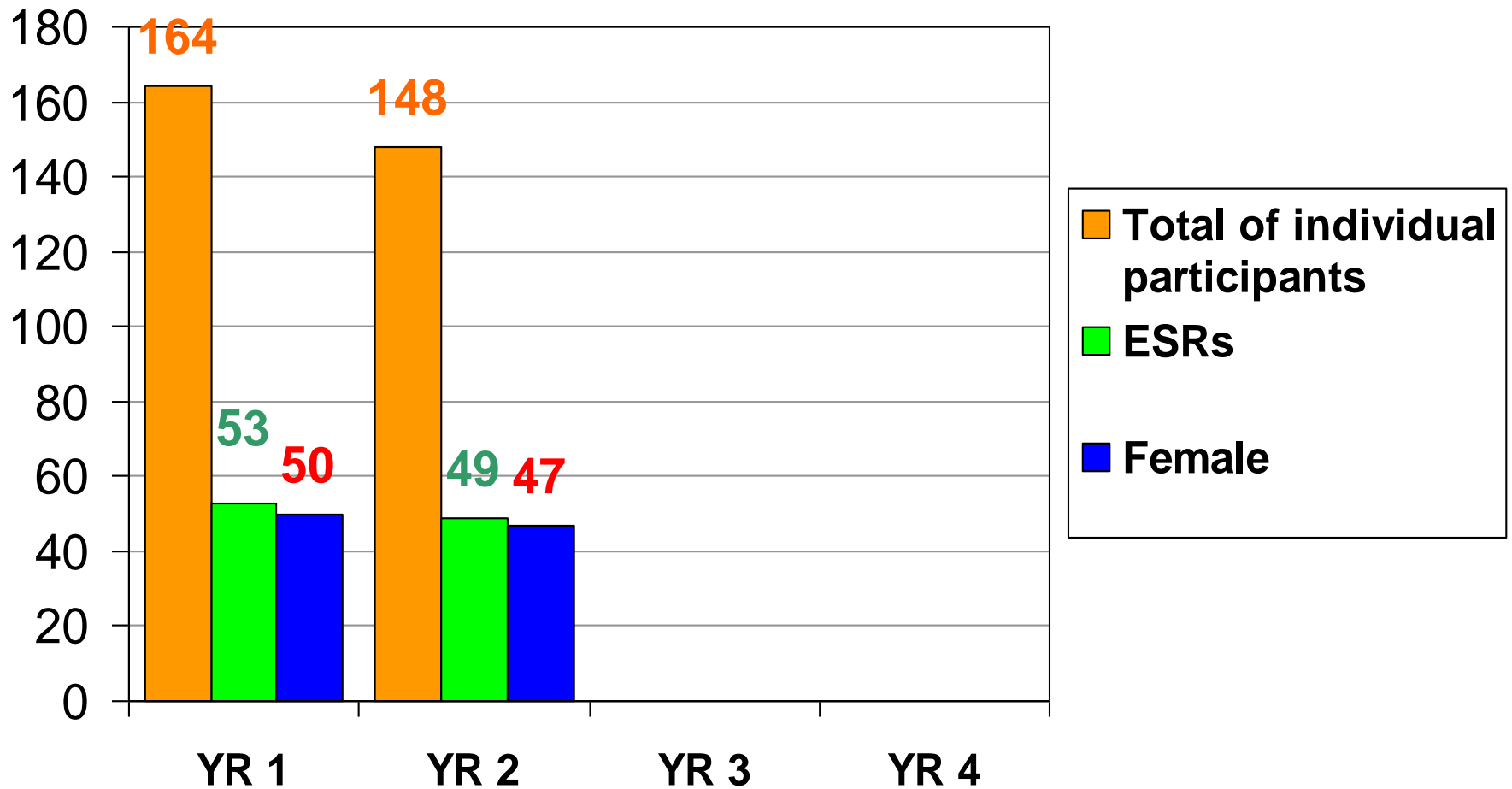
Institute of Plant
Protection

National Research
Council (CNR)

Ms Clementina Falco

Sesto Fiorentino - ITALY

Action participants



Use of COST instruments

	YR 1	YR 2	YR 3	YR 4
No. of MC / WG meetings	1+1/4	1/4	1/4	#
No. of STSMs	4	15	15	#
No. of workshops / conferences	1	1	2	#
No. of joint publications	1	16	(8)	#
No. of training schools	0	2	0	#