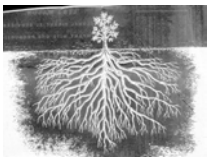
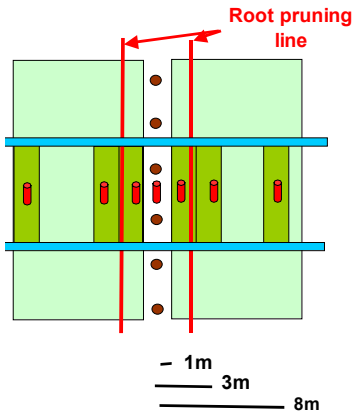
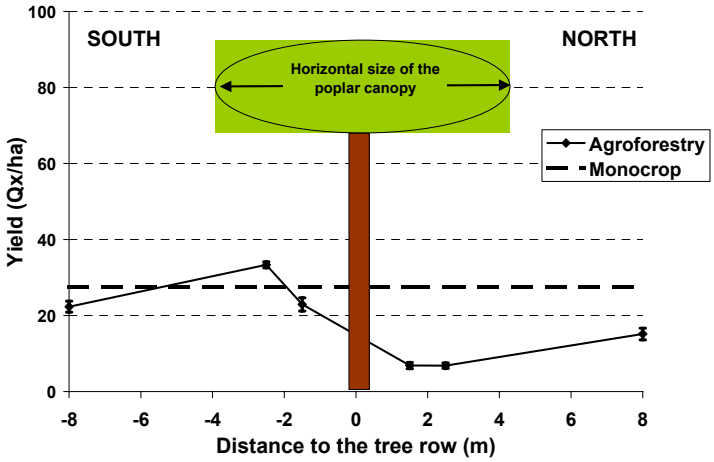


Quality of Life and Management of Living Resources

Silvoarable Agroforestry For Europe (SAFE)

European Research contract QLK5-CT-2001-00560





SAFE CONSOLIDATED PROJECT PROGRESS REPORT
Second Annual Report (August 2002-July 2003)

Progress Summary and Volume 1

September 2003

SAFE Project Progress Summary – Month 24

Section 1: PROJECT IDENTIFICATION Information to be provided for project identification		**NOT CONFIDENTIAL**
Title of the project: **SILVOARABLE AGROFORESTRY FOR EUROPE**		
Acronym of the project: **SAFE**		
Type of contract **Shared-cost RTD**		Total project cost **4,256,188 €**
Contract number **QLK5-CT-2001-00560**	Duration **42 Months**	EU contribution **2,087,450 €**
Commencement date **1 August 2001**	Period covered by the progress report **1 August 2002 – 31 July 2003**	
PROJECT COORDINATOR		
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Telephone: **33 4 99 61 23 39**	Tealeaf: **33 4 67 52 21 16**	E-mail address **Dupraz@ensam.inra.fr**
Key words: **agroforestry, modelling, policy**, ,		
World wide web address: http://www.montpellier.inra.fr/safe/		
List of participants: See project progress Summary (Volume 1)		

Table 1: List of participants

Participant 1: Co-ordinator ✉ **INRA (Institut National de la Recherche Agronomique)** UMR Systèmes de Culture Méditerranéens et Tropicaux 2, PLACE VIALA, 34060 MONTPELLIER, France	**DR CHRISTIAN DUPRAZ** E-M: dupraz@ensam.inra.fr ☎ 33 (0) 4 99 61 23 39 Fax 33 (0) 4 67 52 21 16
Participant 2: Contractor ✉ **WU (Wageningen University)** Department Plant Science, Group Crop and Weed Ecology P.O. Box 430, 6700 AK, Wageningen, Netherlands	**DR WOPKE VAN DER WERF** E-M: wopke.vanderwerf@wur.nl ☎ (31) 317 484772 Fax (31) 317 484892
Participant 3: Contractor ✉ **NERC (Natural Environment Research Council)** Centre for Ecology and Hydrology Maclean Building, OX10 8BB, Wallingford, OXON, United Kingdom	**DR NICK JACKSON** E-M: naj@ceh.ac.uk ☎ (44-1) 491 838 800 Fax (44-1) 491 692 424
Participant 4: Contractor ✉ **UNIVLEEDS (University of Leeds)** School of Biology Woodhouse Lane, LS2 9JT, Leeds, United Kingdom	**DR. DAVID PILBEAM** E-M: d.j.pilbeam@leeds.ac.uk ☎ (44) 113 2332895 Fax (44) 113 2332835
Participant 5: Contractor ✉ **CRAN (Cranfield University)** Silsoe, MK45 4DT, Bedfordshire, United Kingdom	**DR. PAUL BURGESS** E-M: P.Burgess@cranfield.ac.uk ☎ (44) 1525 863046 Fax (44) 1525 863344
Participant 6: Contractor ✉ **CNR (Consiglio Nazionale delle Ricerche** **Istituto per l'agroselvicoltura** Via Marconi, 2, 05010 Porano, Italy	**DR. PIERLUIGI PARIS** EM: P.Paris@ias.tr.cnr.it ☎ 39-0763 374674 Fax 39-0763 374330
Participant 7: Contractor ✉ **UEX (Universidad de Extramadura)** E.U. de Ingenieria Tecnica Forestal Avd. Virgen del Puerto, 10600 Plasencia, Spain	**DR. GERARDO MORENO** E-M: gmoreno@unex.es ☎ 34 27 427000 Fax 34 27 425209
Participant 8: Contractor ✉ **FAL (Eidgenössische Forschungsanstalt für** **AgrarÖkologie und Landbau)** Produkt Ökocontrolling Reckenholzstrasse 191, CH-8046, Zürich, Switzerland	**DR. FÉLIX HERZOG** E-M: Felix.Herzog@fal.admin.ch ☎ (41) 1 377 71 11 Fax (41) 1 377 72 01
Participant 9: Contractor ✉ **APCA (Assemblée Permanente des Chambres d'Agriculture)** Sous-Direction des Politiques Agricoles et rurales 9, Avenue Georges V, 75008 Paris, France	**M. PIERRE SAVY** E-M: pierre.savy@apca.chambagri.fr ☎ 33 (0) 1 53 57 11 43 Fax 33 (0) 1 53 57 10 05
Participant 10: Contractor ✉ **AUTH (University of Thessaloniki)** Faculty Of Forestry and Natural Environment, Laboratory of Range Ecology 54006, Thessaloniki, Greece	**DR. VASILIOS PAPANASTASIS** E-M: vpapan@for.auth.gr ☎ +30 31 998933 Fax +30 31 992721

SAFE Project Progress Summary 1

Section 2: Project Progress Report **NOT CONFIDENTIAL**

Objectives:

During its second year, the SAFE project planned to:

- Set up new silvoarable plots in Greece, The Netherlands, and Germany to assess if local policy could sustain agroforestry and to provide a local demonstration of silvoarable technology (WP9)
- Release a database of current European Silvoarable experiments (WP3)
- Collect data from silvoarable experimental sites of the SAFE consortium (WP3)
- Design modules for above-ground (WP4) and below-ground tree-crop interaction (WP5) and integrate them into process-based biophysical models of tree-crop interactions in silvoarable systems (WP6)
- Design a simplified biophysical model that could be linked later to an economic model to assess performances of silvoarable technology (WP6)
- Collect data for GIS analysis of the future of agroforestry in Europe (WP8)
- Collate European national policies that impede or promote adoption of agroforestry across Europe (WP9)

SAFE Project Progress Summary 2

Results and Milestones:

- All meetings were held as scheduled, with large attendances: the second CMC at Cranfield University (12-13/09/02, 20 participants); a biophysical modelling workshop at Clermont-Ferrand (4-6/12/02, 22 participants); the third CMC and modelling workshop at the University of Plasencia (14-15/04/03, 25 participants). All contributions to and minutes of these meetings are available on the SAFE web site. Eleven working visits were also organised during this second year. All CMC and working visit reports are available on the SAFE web site.

- The structure of the SAFE biophysical model of tree-crop interaction was agreed at the Clermont-Ferrand workshop, and the modules were designed by four partners of the project (WP4 and WP5). They were integrated by INRA Montpellier, allowing the release of the Beta version of the HySAFE model in September 2003 (WP6).

- The extant traditional silvoarable systems database was improved (WP2)

- All experimental sites were managed to provide calibration and validation data for the SAFE biophysical models (WP3). Common protocols were applied for describing distribution of light (using hemispherical pictures) at five sites and of root length density (soil coring) at two sites.

- A new economic model derived from previous Arbustra and Popmod models was implemented (WP7)

- A methodology for scaling-up plot results was agreed, including the choice of Landscape Test Sites in three countries, and documentation (digitised maps) for this purpose was collected (WP8)

- Six new silvoarable trials were set up in Greece, The Netherlands and Germany as planned (WP9)

- Four milestones were scheduled during the second year of the project. Two were considered not achievable at that time, and were delayed to year 3 (D4: map of target systems in Europe and D5 collation of European policies). The two others were met with some delay: the new experimental plots were set up (D3) and the water extraction modules were delivered (D6).

- The project produced five deliverables during this second year: two contract reports (WP10), and the descriptions of the aboveground HySAFE module, the belowground HySAFE module, and the economic module. The five deliverables are annexed to the report, and are available on-line on the web site.

- Both consortium members and visitors used the SAFE web site, with a rise in the number of daily visits. It was developed with a number of new consistent features such as a common disk for file sharing, an attractive "Image of the Month" windows for all visitors, and a display of papers published about the project (WP10).

SAFE Project Progress Summary 3

Benefits and Beneficiaries:

The SAFE project was more exposed to the public during this second year. A number of papers were published in technical journals, mostly in France, but also in Italy and Spain.

A side effect of the SAFE project is that agroforestry is getting a higher profile in Europe. In France, a significant number of commercial agroforestry projects are planned to be planted during the 2003-2004 winter. This is mainly due to SAFE activity and to results of research becoming available.

A further impact is that there may be more research and development into agroforestry in future: scientists from different disciplines are now interested in analysing environmental aspects of agroforestry systems not covered by the SAFE project.

Future Actions:

SAFE project management:

The next CMCs are now planned for the third year of the project at Porano in October 2003 and Toulouse in March 2004. A workshop with end-users will be organised in the spring of 2004, possibly in Berlin. Additional technical workshops are scheduled: "Integration of HySAFE" (Montpellier, December 2003); "Playing with LoSAFE" (Wageningen, spring 2004);

The final database of the experimental resource of the consortium is expected to be completed as planned in March 2004.

Biophysical modelling: The HySAFE model will be delivered to the consortium at the beginning of 2004 for testing and validation. The 2004 growing season will be used to provide a second year of field data for calibrating and validating HySAFE and BeloSAFE. The HySAFE modules will be validated with more sophisticated models, including architectural models of the trees developed by INRA. BeloSAFE will be used to provide time series of tree and crop yields for economic investigation.

Virtual experiments using the biophysical models will be launched in summer 2004 as scheduled. These experiments will help to explore the various combinations of silvoarable technology in different European sites.

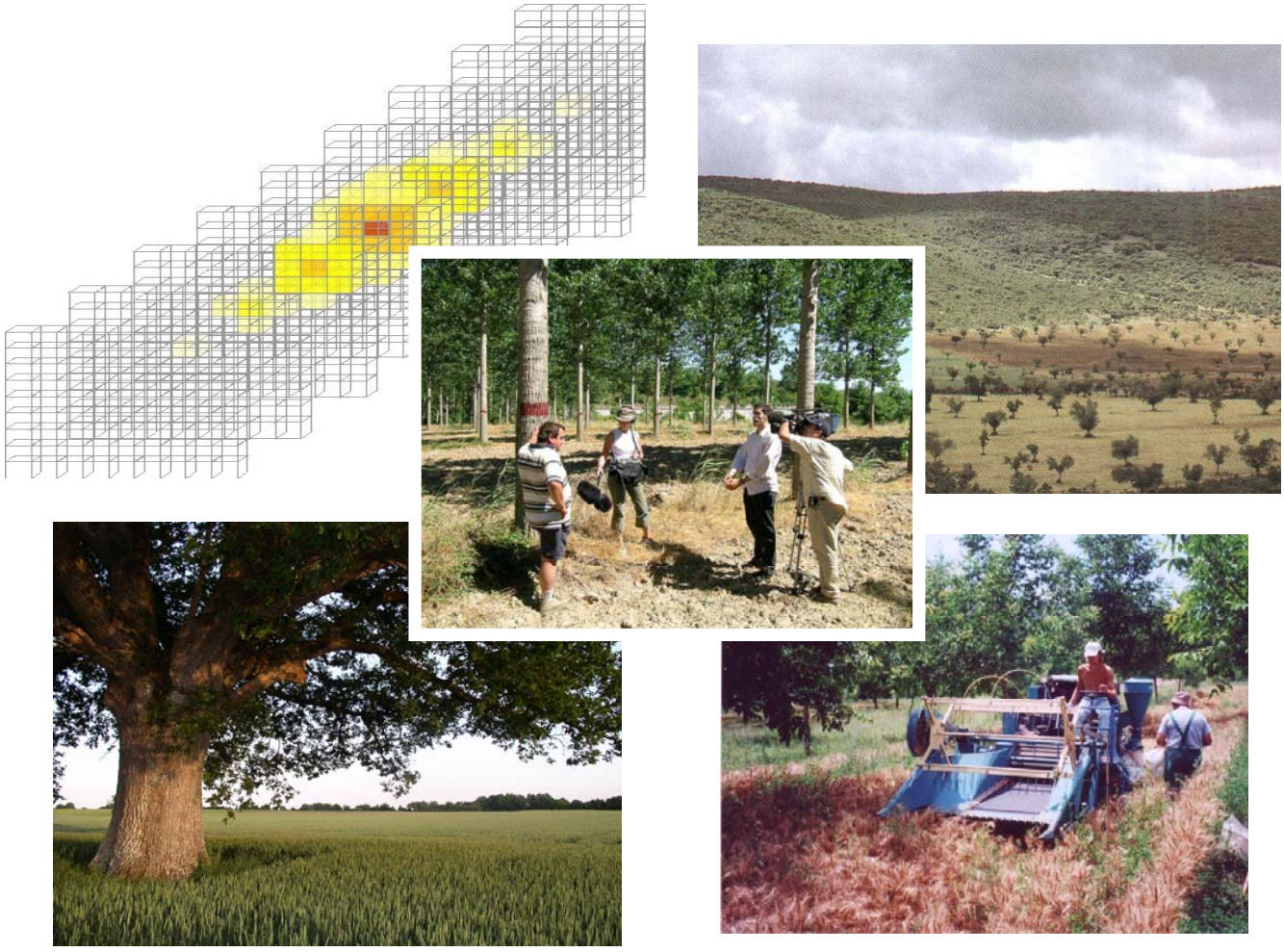
Up-scaling and policy: SAFE participants will contribute to the design of national and European policies during the third year of the contract, by providing simulation results of adoption of agroforestry at both national and European scales.

A special emphasis will be made during the third year of the project on scientific publications. Papers are also expected to be published in technical journals.

Quality of Life and Management of Living Resources

Silvoarable Agroforestry For Europe (SAFE)

European Research contract QLK5-CT-2001-00560



Volume 1

Objectives; Work plan; Management and Coordination; Exploitation and Dissemination

September 2003

TABLE OF CONTENTS

The following reports are attached to the second year report as separate documents:

Workshop Reports and Minutes

Modelling Workshop, Clermont-Ferrand December 2002
Modelling Workshop, Plasencia April 2003

CMC Reports and Minutes

2nd CMC report, Cranfield (September 2002)
3rd CMC report, Plasencia (April 2003)

Key Working Visit Reports:

Working visit of Christian Dupraz and Isabelle Lecomte to INRA-APC
Working visit of Christian Dupraz to AUTH
Working visit of Anil Graves to UEX

Two Deliverables

Deliverable 4.1
Deliverable 5.1

More reports are available on-line on the SAFE web site, including all reports of working visits.

PART 1: OBJECTIVES AND EXPECTED ACHIEVEMENTS

These are unchanged from the Technical Annex. See the Technical Annex for a full description of the objectives. Only key features are repeated here.

Silvoarable agroforestry comprises widely spaced trees intercropped with arable crops. This project builds on recent findings that indicate that modern silvoarable production systems are very efficient in terms of resource use, and could introduce an innovative agricultural production system that will be both environment-friendly and economically profitable. Growing high quality trees in association with arable crops in European fields may improve the sustainability of farming systems, diversify farmers incomes, provide new products to the wood industry, and create novel landscapes of high value. In support of the European Common Agricultural Policy, the SAFE project will provide models and databases for assessing the profitability of silvoarable systems, and will suggest unified European policy guidelines for implementing agroforestry.

To meet these expectations, the SAFE project will develop biophysical and socio-economic tools to inform farmers and policy-makers of the potential for silvoarable agroforestry to contribute to the integrated and sustainable development of European rural areas. The final target is a coherent 'Agroforestry Policy Options' document that can be used by the EU to produce header and interpretative regulations, and by Member States or Autonomous Regions to assess the effect of forestry or agricultural grants on the uptake of agroforestry in the context of best European practice.

The first main objective of the project is to reduce the uncertainties concerning the validity of silvoarable systems. This objective implies two tasks:

i) To build up a network to monitor the unique resource in silvoarable experiments provided by the participants in the consortium using agreed measurement protocols and database structures;

ii) To design and validate a mechanistic model of tree-crop interactions in silvoarable plots. During an initial workshop, we need to examine existing models, identify their shortcomings, establish what new modules are needed and allocate priorities to their development for a new model.

The new model will be validated using experimental data from the consortium, and will be used for predicting the future yields from silvoarable plots at a number of European sites.

The second main objective is to extrapolate plot-scale results to individual farms or sub-regions, and to provide a unified framework to assess the impact of agricultural prices and EU regulations on the likely uptake of agroforestry. This second main objective implies three tasks:

i) To link the biophysical modelling of a silvoarable plot with economic modelling, and to upscale the resulting integrated bio-economic model from the plot scale to the farm and the regional scales;

ii) To identify where, in different European countries, agricultural and forestry policies conflict over the treatment of silvoarable agroforestry;

iii) To define and predict the economic outcomes of a range of scenarios for the implementation of silvoarable agroforestry.

PART 2: PROJECT WORKPLAN

INTRODUCTION

The SAFE project intends to i) assess the production and value of silvoarable systems, ii) forecast the potential of silvoarable agroforestry to be adopted as a new farming system, and iii) suggest guidelines for a coherent package of forestry and agri-environmental incentives which will not disadvantage agroforestry when compared with conventional forestry or agriculture.

The work-plan consists of 10 work packages (WP), each with deliverables and milestones. WP1 was closed during the first year as expected. All other WPs were active during the second year of the project.

Figure 1: Did you know that the shade of a single oak tree could be that large? (SAFE participants at the 3rd SAFE Consortium Management Committee meeting, University of Plasencia, April 2003)

PROJECT STRUCTURE, PLANNING AND TIMETABLE

Modifications to the work plan

During the second year of the SAFE project, only minor modifications of the work plan were decided by the Consortium Management Committee meetings at Cranfield University (September 2002) and the University of Plasencia (April 2003).

1. Milestone 4 (Map of the potential target areas for silvoarable agroforestry in Europe) was moved to month 36 to be in phase with deliverable D9.3

2. The UEX sub-contract with Lourizan was cancelled. The UEX contractor will reallocate the money to field measurements, as they are considered essential by the Consortium.

Some change in responsibilities of personnel were also decided during the second year of the project:

1. François Bussière from the INRA APC unit took over Hervé Sinoquet as WP4 leader although Hervé Sinoquet remained involved in SAFE as a researcher. As a

consequence, approximately half the money allocated to INRA-PIAF was transferred to INRA-APC.

2. Two more people from INRA-Amap (François de Coligny and Claude-Eric Parveaud) joined the project to support Daniel Auclair who had been given more non-SAFE responsibilities by INRA.

3. Roel Stappers, who was appointed as a Ph.D. student by Wageningen University resigned from his position in July 2003, after 18 months of work for SAFE WP6. This was a difficult problem, as Roel's work was a key element of WP6 and WP7 (designing the simplified biophysical model and doing uncertainty analyses on it). We decided to replace his post with a post-doctoral position that will hopefully be filled in October 2003.

The Deliverables plan

Four deliverables were to be completed during the second year of the SAFE project:

Deliverable 4.1: François Bussière: Light partition and microclimate modules (Month 18 January 2003) were finally delivered at Month 26 (September 2003)

Deliverable 5.1: Nick Jackson: Water partition and uptake module (Month 18 January 2003) was finally delivered at Month 26 (September 2003)

Deliverable 7.1: Paul Burgess: Silvoarable economic module (Month 18 January 2003) was delivered on time.

Deliverable 2.2: Felix Herzog: Database of target farming systems (Month 24 July 2003) was postponed to Month 36 and modified. There was a debate at the Plasencia CMC about the meaning and usefulness of this deliverable. It was agreed that

> 1. Within the SAFE project we need to be able to predict where agroforestry might be adopted, and in what farming systems, at a European scale.
>
> 2. It is not useful to build a database for this. Instead we should use an existing European database of farming systems, and try to extract information from this database by using criteria relevant to the adoption of silvoarable systems, such as biophysical aspects (like soil type and fertility), or aspects of farming system (like the size of the farm, the age of the farmer, or the availability of free labour time in the year). These examples of criteria are only to illustrate the concept, but more work is planned to define them. The survey of the attitudes of farmers to agroforestry will probably help identify such criteria. The best European database should be identified as soon as possible. The criteria to adopt should be discussed by the consortium. The deadline for this deliverable is postponed to month 36 (July 2004), to allow us to incorporate information from the current survey of farmers' attitudes.

Deliverable 6.1: Martina Mayus: Time-series predictions of tree and crop yields (Month 24 July 2003) are postponed to month 32, as a consequence of the delay in completing the biophysical models. To help partners of 'client' WPs (WP7, WP8 and WP9), provisional time series of tree and crop performance based on expert knowledge will be made available at Month 28. They will be formatted exactly the same way as the time-series expected from the biophysical models. This will allow the partners to run their analysis again by simply replacing old time-series by improved ones.

Deliverable 2.3: Fabien Liagre: Farmers' view on silvoarable issue report formerly Deliverable 8.3 see first annual report). The work is progressing more rapidly than expected, and it could be released at month 30 instead of month 38, its initial schedule.

Modification to the milestone calendar

> **Milestone 3:** Gerry Lawson: Setting up of silvoarable plots in countries where the technology is unknown: scheduled on Month 9, but finally reached in Month 20 (March 2003) due to the start of the project in the middle of a growing season.
>
> **Milestone 4:** Piero Paris: Map of the potential target areas for silvoarable agroforestry in Europe: moved to Month 36 (July 2004), together with Deliverable D2.2.
>
> **Milestone 5:** Gerry Lawson: Collation of existing national and sub-national agroforestry policies and attitudes: month 24 (July 2003): moved to month 32, due to a delay in collecting information on policy in some European countries.

OVERVIEW OF PROGRESS

The second year of the SAFE project was very busy for most WPs. Only WP4, WP6 and WP9 were delayed.

- All meetings were held as scheduled, with a large attendances: the second CMC at Cranfield University (12-13/09/02, 20 participants); a biophysical modelling workshop at Clermont-Ferrand (4-6/12/02, 22 participants); and the third CMC and modelling workshop at the University of Plasencia (14-15/04/03, 25 participants). All contributions to and minutes of these meetings are available on the SAFE web site. Eleven working visits were also organised during this second year. All reports are available on the web site.

- The structure of the SAFE biophysical model of tree-crop interaction was agreed at the Clermont-Ferrand workshop, and the modules were designed by four partners of the project (WP4 and WP5). They were integrated by INRA Montpellier, allowing the release of the Beta version of the HySAFE model only in September 2003 (WP6), after a six months' delay.

- The extant traditional silvoarable systems database was improved (WP2).

- All experimental sites were managed to provide calibration and validation data for the SAFE biophysical models (WP3). Common protocols were applied for distribution of light (using hemispherical pictures) at five sites and of root length density (by soil coring) at two sites.

- A new economic model derived from previous Arbustra and Popmod models was implemented (WP7), and two publications to international journals on economic modelling of agroforestry systems were prepared.

- A methodology for scaling-up was agreed, including the choice of Landscape Test Sites in three countries and documentation for digitised maps was collected (WP8).

- Six new silvoarable trials were set up in Greece, The Netherlands and Germany as planned (WP9).

- Four milestones were located in the second year of the project. Two were considered not achievable at that time, and were moved to year 3 (M4: map of target systems in Europe and M5 collation of European policies). The two others were reached after some delay: the new experimental plots were set up (M3) and the water extraction modules were delivered (M6).

• The project produced five deliverables during the second year: two contract reports (WP10), and the descriptions of the above-ground HySAFE module, the below-ground HySAFE module, and the economic module. The deliverables are annexed to this report, and are available on-line on the SAFE web site.

• The SAFE web site was used both by consortium members and visitors, with a rise in the number of daily visits. It was developed with a number of new and consistent features such as a common disk for file sharing, an attractive "Image of the Month" for all visitors, and a record of articles and releases in the popular and farming presses, published about the project in Europe (WP10).

Figure 2: Field activity was extremely active during the second year of the SAFE project. After hours of strenuous efforts, the INRA-UAFP team recovers the cutting shoe (look at the crown on top of André Gavaland's head) of the soil coring system that was struck at the bottom of the core, at the Pamiers experimental site.

MAIN PROBLEMS ENCOUNTERED

This second year of the SAFE project was not easy. Problems with management of three work packages created difficulties for the project.

WP4: For personal reasons, the leader, François Bussière, was not play able to coordinate WP4 adequately. He never organised the WP activity, participated only very briefly in the third CMC at Plasencia, and delivered his HySAFE module more than 6 months late. He will not be in charge of WP4 any longer. A new WP4 leader will be appointed at the Porano CMC in October 2003.

WP6: Martina Mayus had difficulties managing the integration of the HySAFE model. Grégoire Vincent will replace her in that task during the third year of the project. Integrating the HySAFE model is a difficult task, and we recognise that we are 6 months behind the schedule for delivering the model. This is mainly because some key modellers from INRA could not involve themselves as much as they intended when we planned the project (for many different reasons, but one key reason was that Xavier Le Roux, who was expected to be a key modeller for the SAFE consortium, left INRA in 2001 and was not replaced). The co-ordinator therefore has looked for help from a good modeller, and identified a French IRD (formerly ORSTOM, Montpellier) scientist, Grégoire Vincent. Grégoire has agreed to spend 4

months working with us during the third year of the project. This should enable us to finish the project in time. Grégoire Vincent is a member of IRD staff not INRA. The Scientific Officer of the SAFE project approved the proposal (in an e-mail dated 9/10/2003) and an amendment to the contract will be prepared.

WP9: Gerry Lawson is in charge of this WP. He was promoted in 2002 and changed position and location (he moved from Edinburgh to the London headquarters of NERC). He decided to keep managing WP9 of the SAFE project, but this proved difficult during the first 8 months of the reporting period. He has been active again over the last two months, and we will discuss his future role in the project at the next CMC in Porano (October 2003).

The coordinator will submit a plan to the next CMC for reallocating funds within the consortium, which will allow for the differing degrees of commitment, involvement and efficiency of the different partners in the SAFE project. INRA-PIAF and INRA-APC may get less, UEX may get more. When this plan has been approved by the CMC, the agreement of Brussels will be sought.

The co-ordinator notes with gratitude that a majority of participants keep working hard and efficiently for the project.

Why are the SAFE biophysical modelling activities late?

The process-based HySAFE model

It is always very difficult to anticipate what difficulties will be met when developing new models. The HySAFE model is ambitious; to derive a fully integrated ecophysiological-based tree-crop interaction model is a challenge. More avenues for reflection are encountered every day. We had to concentrate on key issues ("do not open a can of worms", was the final conclusion at the Clermont-Ferrand workshop when many modellers advocated inclusion of ever more processes in the model, including the impact of earthworms on soil hydraulics!), and this is always a difficulty when each modeller wants to push the common model in their direction.

The SAFE biophysical modelling exercise has turned out to be far more complicated than was expected at the start of the project. For example:

1. Unexpected difficulties were met with the STICS crop model that is included as the crop module in HySAFE. Its translation from FORTRAN to C language was more difficult than expected. The SAFE project benefited from the involvement of Jean-Claude POUPA, an INRA computer scientist, in this task. The final C code of the STICS model was not available until mid-September 2003 (it was expected in March 2003).

2. We initially intended to use an existing crop model "as is" and link it to a tree model. But it appeared then that we had to interrupt the daily routine for the crop every day, forcing us to modify the crop model code. And this code is huge…

But under-estimating the difficulties of modelling is not the only explanation for the delay.

The main reason was the delay in the delivery of the biophysical sub-models by almost all modellers of the SAFE project (and especially by INRA modellers). Some modules such as the microclimate module, the nitrogen uptake module, the tree phenology module, and the tree growth module were still not delivered at the end of April 2003.Co-ordinating more than 10 modellers from different teams appears to be complicated. Delays from one modeller

affect the whole project. We have coped with most of these delays. The first running version of HySAFE will be delivered at the Porano meeting in October 2003, and we still intend to provide the integrated model at month 34 (May 2004) as expected (Deliverable 6.2).

The BeloSAFE simplified model

Contractor 2 (Wageningen University) is in charge of delivering a simplified biophysical model of tree-crop interactions (called BeloSAFE), and of the uncertainty analysis of this model. This model is needed to provide inputs for all economic assessments of silvoarable agroforestry in the project. To achieve this goal, WU contracted a PhD student, Roel Stappers. Roel did well, but due to personal reasons, he resigned and left in August, after 18 months, leaving the work half done.

This as a key deliverable for the project, and some other WPs expect this deliverable within the next 6 months to fulfil their plans. We therefore have to find somebody to replace Roel, and we have decided to hire a postdoctoral fellow on a temporary basis within the University.

COST OF THE SAFE PROJECT

The first year costs were less than expected from the Elektra files of the contract. But during the second year, all contractors were involved heavily in the project, and the total of the costs for the first and the second year are now about the expected cost from the official agenda. The time allocation to the project is only 11 man-months less than what was scheduled (Table 1), which is less than 5% of the expected value.

SECOND YEAR — **SECOND YEAR MAN-MONTHS**

			Official Contract				Allocated				Balance	
Role	No	Short Name	Permanent	Contracted	Subcontract	Total	Permanent	Contracted	Subcontract	Total	Excess	Deficit
CO	1	INRA	26,9	24,0	12,0	62,9	29,7	25,3	12,0	66,9	4,1	
CO	1	INRA Co-ordination	2,4	0,0	0,0	2,4	3,2	0,0	0,0	3,2	0,8	
CO	1	INRA Total	29,3	24,0	12,0	65,3	32,9	25,3	12,0	70,2	4,9	
CR	2	WU	2,5	23,7	2,0	28,2	10,0	8,0	2,0	20,0		8,2
CR	3	NERC	8,8	0,0	0,0	8,8	7,8	0,0	0,0	7,8		1,0
CR	4	UNIVLEEDS	1,4	12,0	0,0	13,4	1,7	12,0	0,0	13,7	0,3	
CR	5	CRAN	1,4	22,1	1,0	24,4	2,8	19,0	0,0	21,8		2,6
CR	6	CNR-IAS	13,2	7,3	0,0	20,5	22,4	11,0	0,0	33,4	12,9	
CR	7	UEX	3,9	9,7	1,5	15,1	17,6	0,0	0,0	17,6	2,5	
CR	8	FAL	1,2	17,6	0,0	18,8	9,5	11,0	0,0	20,5	1,7	
CR	9	APCA	0,6	9,9	0,0	10,5	3,8	8,9	0,0	12,7	2,2	
CR	10	AUTh.	3,0	4,2	1,0	8,2	5,5	0,0	1,0	6,5		1,7
		TOTAL	65,1	130,5	17,5	213,1	113,9	95,2	15,0	224,1	24,5	13,5

Split for INRA			Official Contract				Allocated				Balance	
	No	Short Name	Permanent	Contracted	Subcontract	Total	Permanent	Contracted	Subcontract	Total	Excess	Deficit
	1	AMAP	6,5	0,0	0,0	6,5	8,5	0,0	0,0	8,5	2,0	
	1	UAFP	3,7	0,0	0,0	3,7	3,8	0,0	0,0	3,8	0,2	
	1	SYSTEM	3,6	24,0	12,0	39,6	4,8	25,3	12,0	42,1	2,5	
	1	PIAF	6,7	0,0	0,0	6,7	4,2	0,0	0,0	4,2		2,5
	1	APC	6,4	0,0	0,0	6,4	8,3	0,0	0,0	8,3	2,0	
	1	TOTAL	26,9	24,0	12,0	62,9	29,7	25,3	12,0	66,9	6,6	2,5

Table 1: Allocation of time (person-months) to the SAFE project during the second year.

PART 3-1: WORK PACKAGES REPORTS (SEE VOLUME 2)

For convenient handling of the report, the work package reports have been published in a separate volume (Vol. 2).

PART 3-2: CONTRACTOR REPORTS (SEE VOLUME 3)

Again for convenient handling of the main report, the work package reports have been published in a separate volume (Vol. 3).

PART 4: PROJECT MANAGEMENT AND COORDINATION

INRA co-ordinates the project. During this second year, the main co-ordinating activities included:

- Ensuring a SAFE team spirit among participants, by an active involvement in the SAFE web site, the e-mail list moderation, and some tricks to attract attention (such as puzzles to solve, see below).

What happened to these trees?

A flash flood in September 2002 hit the Vézénobres experimental plot, leaving trees wrapped in plastic sheets used for mulching asparagus crops in the vicinity. More than 40 people were killed by the floods, that delayed all experiments by INRA-SYSTEM on this plot during the second year of the SAFE Project

What happened to these trees?

Soil was gathered around the trunks of these old olive trees in Northern Spain. According to the farmer, this favours stem flow penetration in the soil and prevents subsequent soil evaporation. A way of managing scarce water resources adapted to heavy Mediterranean storms that cause high stem flow rates

Figure 3: Answers to the riddles of the first Annual Report

- Co-ordination of measurements and modelling activities of the participants. The co-ordinator visited the contractors of INRA-APC, INRA-UAFP, AUTH and UEX during the second year. The coordinator has not visited CNR and FAL yet.
- Preparation and organisation of the two joint contract reports to the EU, including technical and financial reports.
- Distribution of financial support from the EU.
- Action to replace unavailable WP leaders (mainly WP4 and WP6).
- Organisation and moderation of the two annual CMC meetings, and preparation of the CMC reports.

The consortium organised two CMC meetings for monitoring the project during the second year; at Cranfield University (12-13/09/02, 20 participants) and at the University of Plasencia (14-15/04/03, 25 participants).

Project management is considered as a distinct WP, and required 3.2 person-month during the second year (Table 1). The co-ordinator, using the tables presented below, manages the project's finances.

Year 1

Role	No	Name	Man-Month	Personnel	Equipment	Subcontract	Travel	Consumables	Computing	Overhead	Total
CO	1	INRA	-3,8	-17 519	-1 175	6 262	982			-36379	-47828
CO	1	Co-ordination	0,1	78			-3 527				-3449
CO	1	INRA Total	-3,8	-17 441	-1 175	6 262	-2 544			-36379	-51277
CR	2	WU	-9,4	-16 949		-9 058	-255	-3 800		-4201	-34263
CR	3	NERC	-2,4	9 193		2 699	1 227	-1 241	317	11116	23311
CR	4	UNIVLEEDS	-2,6	-18 011			-692	-765		-3894	-23361
CR	5	CRAN	-0,3	-950		-5 833	-1 345	-2 230	-117	-928	-11403
CR	6	CNR-IAS	9,3	1 231			-966			984	1249
CR	7	UEX	-0,1	-10 664	-8 707	-6 500	-3 269	-3 957		-5319	-38417
CR	8	FAL	-0,7								
CR	9	APCA	5,9	10 976			1 338	-2 500		1963	11776
CR	10	AUTh.	-5,3	-550		-2 500	-296	-644		-298	-4288
		TOTAL	-9,4	-43165	-9881	-14930	-6804	-15137	200	-36956	-126673

Table 2: Difference between the actual costs and the project forecast during the first year (€) –positive values = excess costs

The first year costs were much less than expected, due to a late start in summer of the project. APCA was the only contractor with cost above that expected, as the initial plan did not include much APCA activity during the first year. This was considered an error during the contract preparation, as APCA's contribution was necessary since the inception of the project. UEX failed to provide substantial cost statements, due to local administrative difficulties.

Year 2

Role	No	Name	Man-Month	Personnel	Equipment	Subcontract	Travel	Consumables	Computing	Overhead	Total
CO	1	INRA	4,1	26424	1356	-9943	-7912			40969	64033
CO	1	Co-ordination	0,8	5886			-1672				4214
CO	1	INRA Total	4,9	32310	1356	-9943	-9585			40969	68247
CR	2	WU	-8,2	8322		105	28			1410	8565
CR	3	NERC	-1,0	-10998		2462	3697	-1557	-1233	-13315	-20929
CR	4	UNIVLEEDS	0,3	-8978			694	-302		-1324	-7944
CR	5	CRAN	-2,6	-14961		-344	-3257	210	-1872	-2878	-23102
CR	6	CNR-IAS	12,9	4920			1306			3936	10162
CR	7	UEX	2,5	3934	4941	300	-3200	2782		1691	10448
CR	8	FAL	1,7								
CR	9	APCA	2,2	-13644			1048	-2983		-3116	-18695
CR	10	AUTh.	-1,7	1897		6250	3488	-619		953	11969
		TOTAL	11,0	2803	6297	-1170	-5781	-2470	-3105	28327	38720

Table 3: Difference between the actual costs and the project forecast during the second year (€) – positive values = excess costs

During the second year, the costs are above the expected, as a result of the deficit during the first year. UEX performed better and submitted higher costs.

Total Year 1 + Year 2

Man-Month	Personnel	Equipment	Subcontract	Travel	Consumable	Computing	Overhead	Total
0,2	8905	181	-3681	-6930			4591	16205
0,9	5964			-5199				765
1,1	14869	181	-3681	-12129			4591	16970
-17,6	-8628		-8953	-227	-3800		-2791	-25698
-3,4	-1805		5161	4924	-2797	-916	-2200	2382
-2,3	-26988			1	-1067		-5218	-31305
-2,9	-15911		-6177	-4602	-2020	-1989	-3806	-34506
22,2	6151			340	0		4920	11411
2,4	-6730	-3766	-6200	-6469	-1176		-3628	-27969
1,0								
8,1	-2668			2386	-5483		-1153	-6918
-7,0	1347		3750	3191	-1263		656	7680
1,6	-40362	-3585	-16099	-12585	-17607	-2905	-8629	-87953

Table 4: Difference between the actual costs and the project forecast during the first two years (€) – positive values = excess costs

The total person-month involvement for the first two years is very close to the contracted values. The total costs are 87 953 euros below the expected value, mainly due to the slow start of the project during the first year. This is only 3% of the total expected costs (Table 5).

Year 1 + 2

Role	No	Name	Man-Month	Personnel	Equipment	Subcontract	Travel	Consumable	Computing	Overhead	Total
CO	1	INRA	0,2%	2%	2%	-4%	-27%			1%	1%
CO	1	Co-ordination	18,7%	21%			-40%				2%
CO	1	INRA Total	0,9%	4%	2%	-4%	-32%			1%	1%
CR	2	WU	-33,3%	-5%		-22%	-2%	-100%	0%	-7%	-9%
CR	3	NERC	-18,5%	-2%			52%	-85%	-11%	-2%	1%
CR	4	UNIVLEEDS	-10,9%	-38%			0%	-27%		-32%	-32%
CR	5	CRAN	-8,4%	-15%		-53%	-30%	-40%	-40%	-14%	-20%
CR	6	CNR-IAS	51,7%	5%			3%			5%	5%
CR	7	UEX	10,3%	-27%	-37%	-62%	-74%	-16%		-35%	-39%
CR	8	FAL	3,3%								
CR	9	APCA	80,8%	-7%			48%	-100%		-12%	-12%
CR	10	AUTh.	-57,3%	10%		75%	94%	-32%		15%	25%
		TOTAL	0,4%	-3%	-19%	-10%	-11%	-50%	-20%	-1%	-3%

Table 5: Difference between the actual costs and the project forecast during the first two years (%) – positive values = excess costs

Some changes of allocation of money between the SAFE partners will be decided at the next CMC in October 2003, and submitted to Brussels for amending the contract.

PART 5: EXPLOITATION AND DISSEMINATION ACTIVITIES

Most of the exploitation and dissemination activity of the SAFE consortium is expected during the fourth year of the contract.

However, during the second year of the project, there have already been some interesting activities. A number of papers were published in technical journals about the SAFE project. They are displayed on the SAFE web site, (press 'Review' section). Most were published in France and Italy.

A side effect of the SAFE project is that the practice of agroforestry is now more prominent in Europe. In France, a significant number of commercial agroforestry projects are planned to be planted during the 2003-2004 winter. This is mainly due to SAFE activity and results of research becoming available.

A further impact is that there may be more research into agroforestry in the immediate: scientists from different disciplines are now interested in analysing environmental aspects of agroforestry systems that are not covered by the SAFE project.

During the field tour of the Plasencia CMC in April 2003, a **big surprise** was experienced by all SAFE participants (Figure 4). Private companies currently plant huge forest plantations on agricultural land in the province of Extremadura. **It is a challenge for the SAFE project.** Our feeling is that such forest plantations have little future, and may be a big loss of capital for investors, and of land resource for the community. Agroforestry plantations instead would be more productive, more environmentally friendly, and would provide employment for farmers. This example is a strong incentive for the SAFE project to fulfil its objectives, and provide a fair appraisal of the value of such projects.

Figure 4: A huge forest plantation on agricultural land near Plasencia in Extremadura… A quick survey of some lines of trees showed high mortality, in a very competitive environment and probably due to competition from weeds … Would agroforestry perform better?

Figure 5: Christian Dupraz (INRA, SAFE project coordinator) and Piero Paris (CNR) inspecting newly planted trees in an afforestation project (April 2003). This is not agroforestry: the green plants are weeds, competing fiercely with the trees for the scarce water resource. Almost all tree seedlings were already dead. Those tree seedlings would probably have benefited from an intercrop that would have maintained a farmer in the system. The farmer would have help control the weeds on the tree lines by cropping the alleys.

PART 6:ETHICAL ASPECTS AND SAFETY PROVISIONS

The SAFE project does not come within the scope of any of the ethical aspects listed in the Framework VI call for proposals. The SAFE project does not make use of any genetically modified organisms.