HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on research unit:

Agroécologie

Under the supervision of the following institutions and research bodies:

Institut National de la Recherche Agronomique - INRA

AGROSUP DIJON - Institut National Superieur des Sciences Agronomiques de l'Alimentation et de l'Environnement

Université de Bourgogne - UB

Evaluation Campaign 2015-2016 (Group B)

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

In the name of HCERES,[1]

Michel Cosnard, president

In the name of the experts committee,[2]

Jean-Luc Chotte, chairman of the committee

Under the decree N°.2014-1365 dated 14 november 2014,

[1] The president of HCERES "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5)

[2] The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

Evaluation report

This report is the sole result of evaluation by the expert committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial reviewing by the committee.

Unit name:	Agroécologie
Unit acronym:	
Label requested:	UMR
Current number:	1347
Name of Director (2015-2016):	Mr Philippe LEMANCEAU
Name of Project Leader (2017-2021):	Mr Philippe LEMANCEAU

Expert committee members

Chair:	Mr Jean-Luc CHOTTE, IRD, Montpellier
Experts:	Mr Denis ANGERS, Agriculture and Agri-Food Canada, Canada
	Mr Lammert BASTIAANS, Wageningen University, the Netherlands
	Mr Emmanuel BAUDOUIN, Université Pierre et Marie Curie, Paris
	Ms Evelyne COSTES, Inra, Montpellier (representative of CSS Inra)
	Mr Alain GHESQUIERE, IRD, Montpellier
	Mr Patrick LAUFS, Inra, Versailles (representative of CoNRS)
	Ms Anissa LOUNES-HADJ SAHRAOUI, Université du Littoral Côte d'Opale, Calais (representative of CNU)
	Mr Jon MARSHALL, Agroecology Ltd, UK
	Ms Claire NEEMA, Montpellier SupAgro (representative of CNECA)
	Mr Ole NYBROE, University of Copenhagen, Denmark
	Mr Sebastien STAERCK, CNRS, Strasbourg (representative of the ingeniors and technicians)
Scientific delegate representing the HCERES:	
	Mr Philippe MEROT

Representatives of supervising institutions and bodies:

Mr Alain BONIN, université de Bourgogne

Ms Carole CARANTA, Inra, BAP

Mr Christian LANNOU, Inra, SPE

Ms Catherine RECHENMANN, CNRS INSB

Mr Guy RICHARD, Inra, EA

Mr François ROCHE-BRUYN, Agrosup Dijon

Head of Doctoral School:

Mr Thierry RIGAUD, Doctoral School n° 554 “Environnement-Santé”

1 • Introduction

History and geographical location of the unit

The Agroecology Joint Research Unit was officially created in 2012 and was the result of a long process, which started in 2006, at the request of Inra. Inra provided invaluable support by setting up the Structuring Operation "Agroecology of the cultivated plot" to facilitate and support the creation of the Agroecology TGU ("Très Grande Unité") Unit. During its first mandate (2012-2016) the Agroecology Joint Research Unit was responsible to AgroSup Dijon, Inra (Environment and Agronomy, Biology and Plant Breeding, and Plant Health departments) and Burgundy University. The Burgundy Dijon University Hospital was associated with the project and IPM, one of the four teams of the Agroecology unit, is associated with the CNRS (ERL-CNRS 6300 research unit).

The Joint Research Unit is located mainly at the Inra centre in Dijon Bourgogne Franche-Comté but there are some personnel who work in Agrosup Dijon and in the Burgundy University Hospital.

Management team

Director (TGU): M. Philippe LEMANCEAU (DR Inra).

Management College (CoDir): M. Alain HARTMANN (DR Inra), M. Sylvain JEANDROZ (Pr Agrospup Dijon), M. Laurent PHILIPPOT (DR Inra), M. Christophe SALON (DR Inra), M. Daniel WIPF (Pr UB).

HCERES nomenclature

Principal:	SVE Sciences du vivant et environnement
Secondaires:	SVE2_LS8 Évolution, Écologie, Biologie de l'environnement
	SVE2_LS9 Sciences et technologies du vivant, Biotechnologie
	SVE2_LS3 Biologie cellulaire, Biologie du développement végétal
	SVE1_LS1 Biologie moléculaire, Biologie structurale, Biochimie

Scientific domains

Agro-écologie; agronomie; biochimie; biologie cellulaire; biologie de l'environnement; biologie du developpement végétal; biologie moleculaire; biotechnologies; écologie; écologie microbienne du sol; génétique; génomique; physiologie végétale; phytopathologie.

Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	54	46
N2: Permanent researchers from Institutions and similar positions	43	41
N3: Other permanent staff (technicians and administrative personnel)	135	133
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	1	
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	14	
N6: Other contractual staff (technicians and administrative personnel)	24	
N7: PhD students	39	
TOTAL N1 to N7	**310**	
Qualified research supervisors (HDR) or similar positions	49	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	38
Postdoctoral scientists having spent at least 12 months in the unit	19
Number of Research Supervisor Qualifications (HDR) obtained during the period	5

2 • Overall assessment of the unit

Introduction

The TGU Agroecology focuses on improving basic knowledge of the biodiversity and biotic interactions in agroecosystems, and on the application and enhancement of this knowledge in the conception of innovative agroecological farming systems. The objectives of the project are to i) analyse, understand and act on biodiversity and interactions within communities at different spatial and temporal scales; ii) propose innovative cropping systems, which ensure agricultural production of high quality and in sufficient quantities, while respecting the quality of the environment. The Agroecology TGU develops organizational approaches from gene to agroecosystems and covers temporal and spatial scales from plant to landscape. The unit encompasses disciplinary excellence in soil microbial ecology, ecology and agronomy of weeds, genetics and ecophysiology of legumes, and plant-microorganism interactions, including arbuscular mycorrhizae. Several biological systems are studied: plants, soil microbial populations, plant-microorganism interactions (beneficial and pathogens).

Global assessment of the unit

The TGU Agroecology has become a key player at the national and international levels in agroecology, a field that is strongly supported by national and international policies. During its first mandate, the unit developed a successful balance and good interconnections between pure research, finalized research and transfer to development. Moreover the unit made excellent contributions to the diffusion of knowledge to the scientific community, final users, decision-makers (expertise) and the general public (extension). An extensive effort has been devoted to the development of technical platforms enabling the realisation of the scientific project of the unit and adding a very high value to the unit.

Strengths and opportunities in the context

Strengths:

- scientific excellence of the different research teams in their respective fields;

- pluridisciplinary expertise: all the expertise to provide an integrated approach for agroecology (soil, microorganisms, weeds, legumes, farming practices, …) are present within the unit;

- the capacity and the expertise to develop multi-approach levels, at different temporal and spatial scales to provide a comprehensive view from gene to agroecosystem;

- international and national recognition;

- impressive network of international collaborations;

- very high involvement of the UMR personnel in teaching and training activities;

- good communication on the UMR research activities with socio-economic-cultural world via large outreach actions (public debate, TV, Radio programs, …);

- good success level in the call for proposals from the UE and from ANR (e.g. 17 and 30% respectively in 2014);

- close interaction with the regional socio-economic-cultural world, strong regional support in particular for grapevine and legumes.

Opportunities:

- agroecology topics: current priority themes at the national and international levels;

- part of the I Site-BFC that will reinforce connections with social sciences, which will help transfer and acceptance of innovative cropping systems by farmers;

- availability and proximity of several well equipped technical platforms (GenoSol, Mycroscopy, Serres-PPHD) and Biological Resource Center;

- accessibility to Experimental Unit (EU) at Epoisses and adjacent areas to develop research activities in agroecology under field conditions at large spatial scales;

- initiation of a Provisional Management of Employment and Skills Scheme in collaboration with the institutions (Inra, uB, AgroSup) in order to anticipate the departures due to retirement and the consequent loss of important skills.

Weaknesses and threats in the context

- agroecology encompasses many expectations and might be differently understood by the different stakeholders;

- not yet complete appropriation of the Agroecology challenges by each team in the scope of the global objective of the unit;

- lack of capacity to promote, stimulate, and encourage the different groups/teams of the unit to develop collaborations, which may weaken the whole unit;

- many committees (CoDir, ARPPE- assembly of the team, platforms and groups-, scientific committee, Scientific animation group, unit committee) and cells proposed by the governance chart, whose roles and compositions are not always clearly defined and seem sometimes redundant;

- uncertainty of replacement of all retirements before the end of the mandate and thereby losses of skills;

- risk of unbalance between research activities, training and administrative time-consuming tasks for many teaching researchers;

- risks of dispersion due to the multiple opportunities;

- risk of unbalance between basic and applied research due to the decrease of financing resources for basic research. A shared strategy within the unit to deal with these threats should be defined to keep the unit in the same dynamic as that of its first mandate.

Recommendations

To reinforce added value from being in a TGU, the recommendations are:

On scientific issues:

- strengthen interactions between different teams by clearly defining cross-cutting projects on common models with common resources (e.g. theses in co-direction on common projects between two main themes…);

- ensure that the activities related to the design of innovative cropping systems are really cross-cutting and take into account inputs from soil microbiology, legume genetics, plant-microbe interactions, in addition to weed science;

- develop scientific collaborations with colleagues from Human and Social Sciences (economy, sociology) in the frame of the unit's excellent interaction with its socio-economic environment;

- promote synergies between all expertise available in the unit (soil microbiology, legumes in addition to weed science) to address the scientific challenge of the 5-year project, especially with regard to the development of innovative cropping systems.

On unit organization issues:

- clarify the organization and life at the unit and team levels;

- increase communication, at different horizontal levels (at the team level and between different categories (researchers/teachers, technicians/engineers), and at the vertical level (bottom-up and top-down);

- clarify the role of the theme-based-scientific workshops, as a vector for a more integrative approach, in the organization, decision and scientific policy of the unit;

- on human resources management issues;

- promote the involvement of young researchers in the life of the unit;

- set up, for the next mandate, specific actions to follow the professional status of doctoral students following their PhD: the unit is very attractive for PhD student but no information is given on their follow-up of.

3 • Detailed assessments

Assessment of scientific quality and outputs

Facts on scientific quality and outputs are:

- 480 ACL-peer-reviewed articles- (73% of the papers have a member of the unit in the first, the second or the last position in the author list) have been published in 231 journals, which represents 1.61 publication/FTE (Dr, Pr, Cr, MCF, IR) with a mean IF of 3.6. 66% of these articles appeared in journals in the first quartile. 11.45% with IF>6. Several mostly review articles were published in outstanding journals (Nat Rev Microbiol, IF 23.574; Annu Rev Plant Biol IF 23.300; trends Ecol Evol IF 16.196; Nat Clim Chang IF 14.547) where authors are, except one, in the first, the last position, or ranked in a strictly alphabetical order;

- 40/480 (8.3%) are co-authored by colleagues attached to the different unit teams resulting from inter-team projects;

- 40/480 (8.3%) are co-authored with french laboratories: national collaborations;

- 216/480 (45%) are co-authored with foreign colleagues from 52 countries.

Important progress are made in the relevant fields:

- barcoding and marker development for the Glomeromycota have significantly progressed;

- experimental and modeling tools for the design of sustainable weed management strategies are developped;

- new components of plant immunity are identified;

- new transport systems of sugar are identified;

- microbial diversity plays a key role in soil functioning;

- legume genetics have dramatically progressed;

- microbial communities are involved in N_2O sinks;

- NO is identified as a key signalling component in plant immunity;

- phenotyping tools are developpedin particular for root systems;

- plant-microbe interaction functioning is investigated (e.g. plasma membrane dynamics –nanodomains- occurring in plant defence signalling);

- *rhizophagus irregularis* genome is sequenced and analysed;

- landscape structure has a role in the assembly of weed communities;

- spatial drivers of microbial communities at the landscape, regional and national scales are investigated;

- sulphur and nitrogen transport are identified in both AM (arbuscular mycorrhizal) symbiotic partners.

Short appreciation on this criterion

Scientific production of the unit is excellent (quantity and quality) supporting important progress made in many scientific fields of the unit in relation to Agroecology. Moreover the unit has promoted original approaches to address some outstanding research questions.

Assessment of the unit academic reputation and appeal

Excellent academic appeal and reputation at the international and national levels as illustrated by a wide range of indicators:

- on average contract resources represent almost 70% of the budget of the unit;

- participation to - or coordination of -14 EU projects (1 Marie Curie grant, 2 Networks, 11 projects), 30 ANR projects, 37 projects funded by French Ministries, 5 projects funded by ADEME, 2 projects funded by French Foundations, 15 projects funded by Private companies, almost 90 project funded by regional agencies, and 80 project funded through Inra competitive processes;

- members of the unit have participated to scientific or organization committees of more than 100 meetings or congresses;

- members of the unit have been involved in the animation and management of 40 networks.

The team members:

- have editorial and review activities in different journals including prestigious ones (Nature, PNAS, Plant Cell, J exp Bot, New Phytol, PMPI);

- have recurrent invitations as speakers (more than 112) in international and national meetings, as reviewer's projects for international and national funding bodies (e.g. National Science Foundation (USA), The Swiss National Science Foundation, the Fullbright commission (FRA-USA), the German Research Foundation (DFG), ANR, MAAF…) and as evaluation committee members (e.g. HCERES).

The unit hosted 70 PhD students, almost 30 post-docs and more than 300 undergraduates, that is an excellent score.

Short appreciation on this criterion

The unit has an excellent academic reputation at national and international level.

Assessment of the unit interaction with the social, economic and cultural environment

The unit has developed close collaborations with actors in the socio-economic world, the agricultural council (chambre d'agriculture) and professional organizations, industry (Fond Unique Interministériel-FUI Iris +, LEG'UP, Pour et Sur le Développement Régional-PSDR, Compte d'Affectation Spéciale pour le Développement Agricole et Rural Innovation et Partenariat -CASDAR IP Agrinnov). Four patents (EDARNI, RhizoTubes – Rhizocab, detection systems) have been produced and licence agreements are established with numerous major companies such as BASF, Novozymes (Monsanto), and smaller companies like Rizobacter (Argentina) and Agrifutur (Italy).

Interaction with the environment represents the second activity of the unit mobilizing 20% of the Full Time Equivalent (FTEs), which corresponds to 39 FTEs. This is coherent with the high societal expectations regarding agroecology.

Short appreciation on this criterion

The unit has an excellent interaction with the social, economic environment. The unit has considerable collaborations with a broad array of partners and collaborative initiatives link well to the broad scientific competence of the unit.

Assessment of the unit organisation and life

The Dijon Agroecology unit was created officially in January 2012 after a long process that began in 2006. It brought together, in a unified scientific organisation, research units from various institutes on the Dijon campus that had not previously worked together. The agroecology unit was the result of the unremitting efforts of the current Director of the unit. He was responsible, with the assistance of the management committee, for setting up a governance structure for the Joint Research Unit with services to ensure close communication between the research groups (services for Assembly of the team, platforms and groups (ARPPE) and to organise scientific activities (Research

Assistance Cell, Scientific Animation Cell), with other services responsible for HR management, administration, finance and strategy of the unit:

- administrative & Resource Management Cell;
- communication Cell;
- quality management Cell;
- life-long training;
- healthy and Safety Cell;
- bibliometrics and Assistance with preparation of publications Cell;
- partnership Cell.

While recognizing the value of these efforts and the commitment of the director of the Joint Research Unit and his management team in bringing these teams together within one unit, further progress is still possible including acting on the recommendations made during the previous evaluation.

The missions assigned, in the functional organisation chart of the Joint Research Unit, to the various cells and committees must be clarified. This could be carried out after all members of the unit have evaluated the extent to which the current organisation chart has been adopted. Particular attention could be paid to improving the usefulness of the chart by defining the missions and the respective, separate responsibilities of each of the functions (ARPPE, Workplace Council, Life-long training cell, Partnership Cell, etc) in greater detail. This would give each group or service a better understanding of the bottom-up communication channels that contribute to the decisions made by the unit management to improve coordination. It would also be useful to consider setting up procedures to help new staff with management responsibilities in order to improve the decentralization of responsibilities. It would also be beneficial to assess the top-down and bottom-up channels of information, such as the intranet, and interactions between the various levels of the organization chart. Horizontal communication within the unit could be improved, by revitalizing or setting up effective communication between all those involved in a team and within the various staff categories within the unit (groups of research scientists / lecturers, engineers / technicians).

While recognizing that one single model for the functioning of a very large research unit is probably not a satisfactory solution, unit organisation could be improved by defining more precisely:

- the procedures for allocating and using the financial resources (contracts, support from parent institutes) within the teams;
- the position and role of groups which may differ depending on the teams.

This could be of assistance for the managerial strategy of the Management team to raise interest and attract people to the Management teams and organization, and thus share the managerial load by delegating responsibilities to a larger number of personnel in the various functions of the next mandate organization chart.

The human resources of the unit

The quality of the unit is based on its scientific skills drawn from a wide range of scientific disciplines. This is one of the major strengths of the unit together with the quality of the engineering, technical and administrative personnel.

However, particular attention should be paid to undertaking annual interviews of the technical staff involving the direct line manager and checking that the requirements of each of the parent institutes have been taken into account, in order to ensure an objective assessment of the personnel applications during highly selective promotion reviews and processes.

The committee emphasizes that the in-depth review of the job descriptions of the support service personnel had a beneficial effect, which was recognized by all members of the Joint Research Unit in the functioning of the unit.

The unit provides very good health and safety conditions for the engineering, technical and administrative personnel. The unit management supports training plans for the engineering, technical and administrative personnel.

Experimental platforms and sites

The unit has very high quality experimental platforms, some of which have required considerable human and financial investment. They are instrumental in making the unit better known.

One of the Theme-based Scientific Workshops has led to proposal of setting up an experimental platform on the Epoisse site. The expert committee hopes that this proposal will be developed further, and recommends that the objectives of this landscape scale platform be in line with the overarching objective of the unit which is to design and demonstrate innovative agroecology-based cropping systems. It would be advisable to assign a leader responsible for the scientific workshop on the theme of agroecology at the earliest opportunity.

Short appreciation on this criterion

A very good management strategy combined with the dedicated commitment of the director led to the creation of the unit in 2012 after a long process starting in 2006. The organization of the unit has resulted in considerable scientific productivity of excellence and clear visibility for collaborators and stakeholders.

After this first mandate, the conceptual model set up to organize decision flows and communication within the different levels of the UMR and between personnel and the bottom-up communications channels need to be reviewed to strengthen the management of the unit and to maintain, if not improve, the already very good standard.

Assessment of the unit involvement in training through research

During 2012 – 2015, the unit hosted:

- 426 students (122/year) for internship ranging from 1 week to 6 months [204 undergraduate (secondary schools, technicians, bachelor and post-graduate students (11 M1 and 64 M2) from France (uB and Agrosup Dijon)];

- 50 post-doctoral fellows or contractual scientists and 142 contractual support scientists or technician;

- 83 PhD students. The allocations of most of them came from the French Ministry of Research and Education.

Since the beginning of the UMR, 49 PhD theses have been defended. 38 PhD theses were defended since January 2012. 111 peer review publications from these students, ie 2.3 publication/thesis on average, of which 61% are in Q1 (55% for the whole doctoral school). The average thesis duration is 43 months (compared to 45 months for the whole doctoral school).

Two scientists and 4 PhD students are part of the doctoral school council. PhD students are part of the organisation Forum des Jeunes Chercheurs.

The unit is popular with students who find very good conditions (scientific equipment, technical skills, teaching in seminars) for undertaking their research programs as well as favourable conditions for creating their own activities (PhD student club).

The unit participates to 3 ITN:

- NORA: Marie Curie ITN Nitrous Oxide Research Alliance;

- Love to Hate: Marie Curie IAPP (Pesticides: felicity or curse for the soil microbial community?);

- List_MAPS “Training and Research in *Listeria monocytogenes* adaptation through proteomic and transcriptome deep sequencing analysis”.

The following masters are under the coordination of members of the unit:

• Master 1 “Biologie Biochimie Moléculaire”;

• Master 1 et 2 Research and Professional “Biologie Integrative Plante Microbe Environnement”;

• Master 1 “Vigne-Vin–Terroir”;

• Master 2 Research “Signalisation Cellulaire et Moléculaire”;

• Master 2 “Espace Rural et Environnement”;

• many training modules at the BU and Agrosup Dijon;

• managements of two bachelor (L2 Biology and L3 "Degree in Vine Sciences").

Short appreciation on this criterion

The involvement and responsibilities of the unit in training through research is excellent. Some members of the unit are deeply involved in training through research and and teaching activities. In addition, professors, associate professors and some researchers take part in the life of the UB and Agrosup Dijon through management of or involvement in different structures (conseil scientifique de l'UB, de l'UFR SVT Environnement, Commission Recherche, Conseil de l'École Doctorale "Environnement Santé", …).

Assessment of the strategy and the five-year plan

The SWOT analysis serving as the set point for the future scientific strategy has been formulated based on input from the scientific staff, the technical staff and the PhD students and post-docs.

The five-year plan fits perfectly with the initial engagement letter with clearly defined objectives. It keeps interconnections between pure research, finalized research and transfer to development. The new UMR contract maintains and strengthens the domains covered by agroecology at Dijon, corresponding to the knowledge and understanding of biodiversity and biotic interactions in agroecosystems and their application and enhancement in agroecology. The novel aspect of the strategy is to integrate the agroecology with the upstream economic and societal aspects of the farming systems, as well as with the downstream interests in quality of the food products, dimensions that were absent in the previous scientific project. This integration is even called for by local considerations to interact with the I-SITE-BFC, and is a logical, original and feasible plan, which maintains the core of the current, still developing, organization while adding significant low risk initiatives of importance to the society.

The five-year plan project evolved as compared to the previous contract by:

• partial changes in the team outlines through rearrangements and movements of some team members and skills:

- BIOmE: Microbial ecology and biotic interactions supporting soil ecosystemic functions in agro-ecosystems (Brings together part of the previous MERS and EcolDur teams);

- GESTAD: Agronomy, Ecology and Genetics of arable weeds, design of agroecological cropping systems and landscape (brings together part of the previous GEAPSI and EcolDur teams);

- GEAPSI: Genetics and Ecophysiology of cultivated legumes (same outline as previous contract except groups working on weeds that moved to Gestad);

- IPM: Mechanisms and management of Plants-microorganisms Interactions (team outline unchanged).

• definition of five new theme-based scientific workshops:

- ecology of communities in agroecosystems;

- conception of cropping systems;

- plants-microorganisms Interactions;

- contribution to the development of leguminous ideotypes exploiting biotic interactions;

- interactions between modelling and experiments/observations.

These elements fit well together. The four teams that are proposed have a better-defined scientific focus, being therefore favourable to develop disciplinary excellence as well as for engaging in cross-disciplinary activities (in interconnection with the other teams). The cross-disciplinary workshops, supported by the UMR incentive programme, will be highly significant for stimulating joint projects and hence scientific synergies and UMR cohesiveness. Moreover, the platforms set up and developed during the first mandate, represent a stronghold of the UMR.

Through the SWOT matrix, the unit has pointed out pertinent elements for the next five-year plan, some of these elements not being under the direct responsibility of the unit (workforce, financial support, access to funds).

Short appreciation on this criterion

The overarching goal of the UMR is to design innovative cropping systems based on ecological processes and interactions. A very good five-year strategic plan has been proposed by the unit to deal with this objective.

4 • Team-by-team analysis

Team: IPM "Mechanisms and management of plants-microorganisms interactions"

Name of team leader: Mr Daniel WIPF

Team scientific domains

Arbuscular Mycorrhizal Fungi; Induced Resistance; Innovative practices for more sustainable agriculture; Management Strategies; Membrane dynamics; Nitric Oxide; Physiology and plant pathology, Mycorrhizae, biochemistry, Cell and Molecular Biology, Microbial Ecology; Plant Immunity; Plant-Microorganism interactions (beneficial and pathogenic); Signalling; Soil-borne fungi.

Workforce

IPM Team workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	21	20
N2: Permanent researchers from Institutions and similar positions	8	7
N3: Other permanent staff (technicians and administrative personnel)	27	26
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	1	
N5: Other researchers (Emeritus Research Director, Postdoctoral scientists, visitors, etc.)	5	
N6: Other contractual staff (technicians and administrative personnel)	2	
N7: PhD students	8	
TOTAL N1 to N7	**72**	
Qualified research supervisors (HDR) or similar positions	15	

IPM Team record	From 01/01/2010 to 30/06/2015
PhD theses defended	16
Postdoctoral scientists having spent at least 12 months in the unit	4
Number of Research Supervisor Qualifications (HDR) obtained during the period	

• Detailed assessments

Assessment of scientific quality and outputs

The IPM team has developed original research activities in the highly competitive field of plant-microbe interactions. It benefits from a well-established and long-lasting experience on both pathogenic and mycorrhizal models. The general scope of the group is to unravel the mechanisms governing plant-microbe interactions to identify and develop alternative and original strategies to reduce the use of chemical inputs. The multidisciplinarity of the team made it able to address these issues: i) in different types of plant-microbe interactions (beneficial and pathogenic) considered independently or, still rarely, in combination; ii) at different scales (from molecules to agrosystems).

The team has provided major progresses in the diverse aspects of plant microbe-interactions, for which the team is among leaders worldwide. In the field of signalling networks associated with plant immunity, the IPM team identified a new grapevine flagelin receptor that recognizes only specific types of bacterial flagelins, suggesting evolving strategies of some bacteria to evade immune recognition. The team also evidenced the role of dynamic changes of the plasma membrane as key players of plant immunity and further highlighted their interplay with reactive oxygen species. A series of breakthroughs have also been obtained on nitric oxide signalling. The IPM team identified new S-nitrosylated proteins among which is a calmodulin that links NO function to calcium homeostasis. Calmodulin-S-nitrosylation is unique to plants and provides an unexpected putative mechanism for calcium signalling regulation. The team provided significant progresses for the understanding of arbuscular mycorrhizal symbiosis functioning and ecology. In particular it identified new transport systems for sugars, sulphur and nitrogen in both mycorrhizal symbiotic partners, participating in a better knowledge of the whole transportome in mycorrhiza. Furthermore in a collaborative network, the team delivered the first genome of an arbuscular mycorrhizal fungus (*Rhizophagus irregularis*).

The scientific activity of the team brought them to a series of important methodological breakthroughs. Noteworthy, IPM team developed barcoding and specific markers for Glomeromycota. Such tools have been seminal for mycorrhiza field studies (i.e. European-scale AMF diversity patterns). The team also participated in the development of a series of high-throughput screening systems (i.e. for monitoring Medicago root response to pathogens and nutrient starvation, for elicitor bioactivity monitoring). Cross-cutting projects have emerged from recent researches of IPM team and are under investigation together with other teams of the unit. These activities are part of the theme-based workshops developed within the unit. These include topics on iron-mediated plant microbe interactions (with EcoIDUR team) and on sulphur nutrition in legumes (with GEAPSI team).

The good balance between publication in high-ranked generalist and disciplinary and more specialized journals speaks for a strong quality and excellent valorisation of both basic and applied research. The research developed in the team also is perfectly relevant in the context of the unit. Indeed, it led to substantial cross-cutting publications with other teams and was at the root of several emerging cross-cutting projects .

Concerning its scientific production, the IPM team published 145 articles in peer-reviewed journals (76% of the papers have a member of the team in the first, the second or the last position in the author list), with an average impact factor of 4.0. This represents a mean of 1.6 articles per permanent researcher per year. A majority (53%) of the papers have been co-authored in the framework of international and national partnerships. Furthermore, a significant part of these publications (10%) has been produced together with other teams of the unit. This production is of excellent quality as 68% of the publications fall into the first quartile of the discipline and 26.9% of the papers have an IF over 6. These include research publications in high-ranked disciplinary (Plant Physiol, Plant J., New Phytol…., 20 papers as first, 2nd or last author) and more generalist journals (Nano Lett.; Proc.Natl. Acad. Sci USA as first author…), but also reviews in highly-read journals (Trends Plant Sci., Curr. Opin. Plant Biol….).

Short appreciation on this criterion

The IPM team exhibits an excellent scientific quality and outputs. Its scientific production over the period is abundant and of excellent quality.

Assessment of the team academic reputation and appeal

The IPM team is well established in its research field and has developed a very large and dense network of national and international collaborations as demonstrated by the high rate of co-publication with other groups (48% of the IPM publications have been co-signed with French teams and 53% with international research teams). A very large

part of these collaborations are supported by the numerous funded projects of the IPM team. As a notable demonstration of their excellent scientific reputation and appeal, one can cite the QualiredFruits European FP7 project coordinated by the IPM team and that gathered 7 private companies, 5 research institutes and the ANR Transmut project also coordinated by the IPM team. Beside this, the IPM team participates to 3 other projects funded by the EU, 6 other ANR projects and coordinates or participates to 14 other national projects (FUI, Fond Unique Interministeriel, CASDAR (Compte d'Affectation Spéciale pour le Développement Agricole et Rural…). Altogether more than 50 funded projects obtained at different levels (international, national or regional) support the research performed by the IPM team.

The IPM team organised 2 international and 1 national meeting (on membranes, microbial ecotoxicology and a french-german meeting on plant-microbe interactions). Members of this team participated to 5 scientific committees of international meetings or congress and to the organization committees of international and national meetings or congress. They mention 29 invited lectures (e.g. International Conference on Reactive Oxygen and Nitrogen Species in Plants, Italy; Fungal Genetics Conference, USA; Symposium Plant Cell Signalling, France; Legume Society Conference, Serbia; International Symbiosis Society Congress, Poland, Meeting on Induced Resistance in Plants against Pathogens, Bresil). Finally they coordinated or participated to several international or national networks e.g.: co-founder of the International Plant NO club workshops, co-manager of the Inra Network INDRES (Induction of Resistance).

Members of the IPM team are editors of 3 journals (J. Biol. Chem., Plant Science, Mol. Ecol. Legume Newsletter), editorial board members of 4 journals and acted as guest editors of several special issues in other journals (Adv. Bot Res.; Front. Plan Science; Front. Plant Cell Biol.). They reviewed more than 90 manuscripts for high-ranked journals such as Nature, Plant Cell, PNAS and others. All these points speak for the very high visibility of the IPM team in the international scientific scene and demonstrate their strong involvement in organisation and promoting exchanges at the highest level in their scientific field.

During the period covered by this evaluation, the IPM team hosted 4 international visiting scientists and 10 PhD students of which 3 are co-supervised by IPM team members.

Short appreciation on this criterion

The IPM team benefits from an excellent academic appeal and reputation at the international and national levels. They have a very strong involvement and success in international and national funding schemes, either as coordinator demonstrating their leading role in the field, or as partner demonstrating their unique expertise that is recognised and required by different partners. This high success in attracting collaborative funded projects speaks for their visibility and allows increasing it. The visibility of the group is also demonstrated by their numerous invitations to conferences or to reviews. The group appears very attractive for visiting scientists and foreign students.

Assessment of the team interaction with the social, economic and cultural environment

The IPM team is strongly involved in transferring the basic research they are performing in plant microbe interactions from the lab to applications in two major fields: either to provide novel tools for plant resistance against pathogens or to use plant-microbe interactions to increase plant production and quality. For this, they are working on different plant species/microbe interactions as a response to demands made by professional groups and in the framework of collaborative projects funded by different international, national or regional bodies. Along the first applied objectives, the IPM team is for instance improving the understanding of the parameters affecting elicitor induced resistance (IR) to facilitate its use in field conditions (FUI IRIS +, FUI Defistim projects in partnership with Elicitor distributing companies), or working at improving cyclamen resistance to fusarium (CASDAR project "Fusarium wilt of cyclamen (FuCy): preventive risk and biological control"). Regarding the second major theme, they are testing co-inoculation with PGPR and AMF to increase strawberry yields and quality, testing the potential of AMF management in viticulture as biocontrol agent and as a biological tool to improve grape quality or developing commercial mycorrhizal inoculum in combination with rhizobia to help growth of metallicolous plants. Members of the IPM team develop new molecular tools to perform population genetics in truffle species and are setting up of a truffle orchard in collaboration with producers. More generally, the IPM team has strong connections with professional groups (member of 2 associations, *Moutarde de Bourgogne*, *Recherche sur les Nicotianées*) and are part of the *Bureau Interprofessionel des Vins de Bourgogne*. Surprisingly, no patent has yet resulted from this work.

Beside this strong involvement of IPM team members in applied projects, the IPM team is also deeply devoted to promote communications towards professional audiences (e.g. on agroecology, use of AMF in polluted soils, use of induced resistance) and towards the general public (2 radio, 5 TV programs, about 20 conferences or articles mostly on truffle and mycorrhiza).

Thanks to its strong involvement, the IPM team has established interconnections between pure research, finalized research and transfer to development. Indeed, the IPM team is involved in the development of new technologies targeting the reduction of inputs in crop production and thereby promoting more sustainable and environment friendly agriculture. In this context, the IPM team has close partnerships with regional producers and companies. Some IPM scientists invest heavily in several events contributing to the dissemination of science to general public (public debate, TV and Radio programs, education materials, …).

Short appreciation on this criterion

In conclusion, the interaction of the IPM team with its social, economic and cultural environment is excellent.

Assessment of the team organisation and life

In contrast to other teams of the Agroecology unit, the IPM team as a "shared budget" policy, which facilitates financial solidarity between the different groups of the team.

Assessment of the team involvement in training through research

The IPM team is very involved in training through research and in coordinating master programs.

In the last contract, the IPM team hosted 16 postdoctoral fellows, 27 PhD students and 133 undergraduates students. Most of the hosted PhD students came from various institutes worldwide (China, Germany, Italy, Brazil, Ivory Coast, Poland, Spain, Switzerland) and 3 were under joint supervision with other universities in China, Germany, Italy. Most of the PhDs students had a French ministry of research and education grant. Each PHD student published a mean of 2 articles. 2/3 of the PHD students have a position in public research, 2 years after the end of the PHD.

The team hosts regularly master student internships with the Erasmus program (Masaryk university Czech Republic and Milan University, Italy). One team member is coordinator of the Dijon-Milano Erasmus program.

The team is involved in the coordination of 4 master programs (plant and microbial biology, biochemistry, viticulture), in the management of two bachelor programs and in many training modules at the Burgundy university and Agrosup Dijon

In addition, professors, associate-professors and some researchers take part in the life of Burgundy University and Agrosup Dijon through management (direction of the Institut Universitaire de la Vigne et du Vin), or involvement in different structures (scientific council of the Burgundy University, of the UFR SVT Environnement, committee of the Doctoral School "Environnement Santé", …).

Short appreciation on this criterion

Members of IPM team are deeply involved in training by research and in teaching actions. Their involvement in international training networks is impressive. Overall, the involvement of the IPM team in training through research is excellent.

Assessment of the strategy and the five-year plan

The IPM research topics will be the same, with a continuation of the activities carried out during the previous contract (2012 – 2015) with 3 scientific objectives:

1- investigation of signalling events associated with the establishment and functioning of plant microbe interaction (plant immunity, induced resistance, transportome);

2- functional biodiversity and ecology of soil-borne fungi and a better understanding of the dynamics of fungal communities;

3- contribution to the development of new strategies aiming at reducing the input in crop production, through focusing on the management of AMF potential in improvement of yield and quality crops and IR-elicitors in fields.

The IPM team changes its organizational chart; it will be constituted of 4 groups with new leaders for 2 groups:

1. Plant Immunity and Signalling;

2. Mechanisms and Stimulation of Immunity in Grapevine;
3. Plant Health, Mycorrhiza and Defence;
4. Ecology of soil-born Pathogenic and Mycorrhizal Fungi.

This organisation is a result of discussions in the team for the integration of new topics. For instance, it will allow analysing the relationship between sugar transport and cellular trafficking, or enhancing the study of the cross-talk between plant nutrition and immunity (nitrogen, iron).

Some of these research activities are based on close collaboration with GEAPSI, BIOmE and GESTAD teams, in particular through 4 of the 5 new theme-based scientific workshops. In addition other collaborations are already engaged for instance with the BIOmE team on the trade-off between immunity and growth in plants suffering from iron deficiency.

Short appreciation on this criterion

The project is assessed as excellent. The five-year project is built on the scientific expertise of the team. The internal organization of the team has been modified to strengthen this expertise and consolidate close collaboration with others teams of the unit.

Conclusion

- Strengths and opportunities:

Excellence in their scientific field associated with a very strong international and national visibility and a dense network of collaborations.

The diversity of the model they are using combined with the diversity of the type of research performed (from very basic to applied) allows them to successfully apply to very diverse funding sources.

High success in PhD recruitment via the doctoral school competitive selection, in link with a strong involvement of teacher-researchers in training activities.

Good cognitive and technical transfer from basic research to application, and balanced activities between basic and finalized research.

Excellent contribution to knowledge diffusion to diverse targets: scientific community, final users, decision-markers (expertise) and general public.

Good exploitation of the technical platforms

Opportunities in the framework of Ecophyto II plan for developing alternative solutions to pesticide use.

Opportunities to widen the framework of researches through interactions with other disciplinary fields within I-SITE BFC

- Weaknesses and threats:

Because of the high diversity of the biological processes investigated and models used, there is a risk of dispersion leading to a lack of efficiency and to a reduction of the intra-team collaboration opportunities.

There is a risk of unbalance between basic and applied research activities due to lobbying from the socio-economical world.

There is a risk of unbalance between research activities, training and administrative (time-consuming) tasks for many teacher-researchers.

Uncertain replacement of all retirements before the end of the mandate and, thereby, losses of skills.

- Recommendations:

Maintain and even reinforce intra-team communication and collaboration to promote the efficiency of the research. For instance cross-cutting projects on common models with common resources (e.g. thesis in co-direction on common project on two main themes, …) could emerge between groups. The proposed reorganisation of the team in 4 groups will contribute to this.

Maintain a strong international visibility by maintaining a strong, high-level research on fundamental scientific questions.

Cross-cutting projects between internal groups to IPM and different teams of the UMR have to be reinforced.

Part of the IPM activities should be more focused on UMR key objectives and their application within cropping system to reach the agroecology final goal. A better exploitation of the Experimental Unit (EU) at Époisses may allow developing research activities in agroecology under field conditions.

Team: BIOmE "Biology and Ecosystemic functions of soils"

Name of team leader: Mr Fabrice MARTIN-LAURENT

Team scientific domains

Agroecology; malherbology; nitrous oxide; soil carbon and nitrogen; soil microbial diversity; soil microbial ecology; spatial variability.

For past activities (2012-2016) detailed assessments are based on the two teams "Community Ecology and Sustainability of Farming Systems (EcolDur) and "Environmental microbiology and health risk (MERS). In the new construction, the weed section of the EcolDur team forms the main body of the newly established "Sustainable Management of Arable Weeds" (GestAd) team.

Workforce

ECOLDUR Team workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	17	
N2: Permanent researchers from Institutions and similar positions	18	
N3: Other permanent staff (technicians and administrative personnel)	31	
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers (Emeritus Research Director, Postdoctoral scientists, visitors, etc.)	3	
N6: Other contractual staff (technicians and administrative personnel)	6	
N7: PhD students	20	
TOTAL N1 to N7	**95**	
Qualified research supervisors (HDR) or similar positions	16	

Team record	From 01/01/2010 to 30/06/2015
PhD theses defended	12
Postdoctoral scientists having spent at least 12 months in the unit	7
Number of Research Supervisor Qualifications (HDR) obtained during the period	4

• Detailed assessments

A. Detailed assessments for "Community Ecology and Sustainability of Farming Systems" (EcolDur)
Team leader: Mr Laurent PHILIPPOT

Assessment of scientific quality and outputs

The Ecoldur programme has provided a coherent introduction of ecological principles to the understanding of the functioning of agricultural systems. Work on soil microbiota has links with studies of ecosystem function at higher trophic and spatial levels. New studies at larger spatial scales have advanced our understanding of plant associations and soil microbial functions, and models and simulation approaches have fostered knowledge on system behaviours. This demonstrates a broad scope and original approaches. Significant advances have been made in the fields of soil biodiversity functions, landscape ecology of weeds, soil microflora, and in modelling crop/weed systems. The application of landscape ecology to weed community studies is notable, and the team is recognized as international leaders in this approach. Advances in soil microbial diversity and related soil functions are scientifically highly significant and of international level.

The publication record of the team is excellent, with a number of highly cited papers. Publications are very appropriate, with a mix of specialist and high impact generalist journals.

The team has published 240 peer-reviewed articles, 2.15 Papers/ETP/year, and 16 with impact factor >6.8. 75% of the papers have a member of the team in the first, the second or the last position in the author list. Team members are first authors in review articles such as Nature Reviews Microbiology, Nature Communications and in articles in Adv. Ecol. Res, Plos One, Ecology (17 of the 23 papers in these supports have a member of the team in the first, the second or the last position in the author list).

Short appreciation on this criterion

The team has performed very well, adding to its international reputation over the life of the contract with innovative research and excellent publications. The overall assessment is excellent.

Assessment of the team academic reputation and appeal

There is very strong evidence of research leadership in EU projects and networks, notably the coordination of the large scale EU project ECOFINDERS, as well as two other EU projects. Nine EU projects and networks are in progress. Currently, 4 ANR projects are coordinated by the team and a further 8 ANR projects are in progress. The team contributes to a number of national and international networks, providing opportunities for technology transfer, as well as research. There have been strong contributions as organiser, to EWRS international symposia for weed science and to soil microbiology symposia. The team organised and hosted the first Global Soil Biodiversity Conference (700 participants).

60 invited keynote lectures were given by team members.

The Ecoldur team has contributed to the evaluation of many research proposals, PhDs, science prizes and appointment committees, including abroad. The team is attractive to staff and PhD students from abroad (9 hosted). The team made a number of important editorial contributions, including to some high impact specialist journals, such as Editor of d'Advances in Ecological Research (IF: 6.25) and of The ISME Journal (IF: 9.3) and Editorial Board Member of 12 international journals. There is a good list of contributions to 80 journals, including reviewing.

Through their leading role in the scientific theme workshop "Conception of farming systems", the team has increased the agroecological visibility of the unit, has stimulated multi-disciplinary discussions around agroecology, and has helped to establish the link between more fundamental research and practical improvements at the farming systems level.

Short appreciation on this criterion

The team has developed a strong reputation by contributing to national and international science via symposia, journal editing and reviewing, European project coordination, and project evaluation. The overall assessment for this criterion is excellent.

Assessment of the team interaction with the social, economic and cultural environment

The team contributes to an important series of technology transfer networks across France, demonstrating leadership and quality information exchange. Publications (more than 83) in the agricultural press and popular articles demonstrate connection to the industry and research leadership. Joint projects (6) were developed with technical institutes (ARVALIS), companies (BAYER, BASF). The team received the Award for the Innovative Company National Competition launched by the Ministry of Higher Education and Research in partnership with OSEO. The team was represented at the Milan International Exhibition. Contact with farmers is demonstrated by the various networks (3 RMT, 3 CASDAR, 1 observatory, 1 alliance and DEPHY), e.g. DEPHY Farms Network (methodology and output from the 1900 farms involved in reduced pesticide use), which bring information about the knowledge needs to research team.

Short appreciation on this criterion

The team contributes to series of national networks that provide a means of transferring research results to the industry and for the industry to influence research. There is a strong evidence Ecoldur has excellent achievements in this area.

Assessment of the team involvement in training through research

Clearly the team is involved in teaching at undergraduate and masters levels and currently have 27 PhD students and 13 post-docs. The mean publication rate as first author, for a PhD, is more than 1.5. Staff contributes directly to three masters courses, three other courses and to courses elsewhere in France. PhD students, of whom there have been a significant number, are mentored via the doctoral school, UB, as well as by being supervised by the team. Moreover the team was the Workpackage leader of the EU Marie Curie International Training Network (NORA) and of the EU Marie Curie Industry Academia Partnership (Love to Hate), and has developed several tools: e-learning training module on the conception of organic cropping systems (ENVAM), long pedagogical movies such as “Common ragweed: seed, pollen and Allergy” subtitled in 4 languages.

Short appreciation on this criterion

EcolDur contributes significantly to training and no doubt learns from it. The overall assessment of this criterion is excellent.

B. Detailed assessments for “Environmental microbiology and health risk” (MERS) Team leader: Mr Alain HARTMANN

Assessment of scientific quality and outputs

The MERS team gathers expertise in environmental and clinical microbiology to decipher the risks of spread of human pathogens and antibiotic resistant microorganisms in agro-ecosystems, to unravel mechanisms whereby these microorganisms adapt to their environment, and, eventually to manage risks associated with spread of these organisms by ecological engineering. The research topics of the MERS team are very relevant from a national as well as international perspective. MERS research activities are organized in four clusters.

1) studies of occurrence and survival of antibiotic resistant bacteria and re-emerging pathogens in agro-ecosystems have provided novel information on the occurrence of Extended Spectrum Beta Lactamase (ESBL) producing bacteria and of *Mycobacterium bovis* in soil. These studies are in principle descriptive but serve as an important platform for developing innovative electrochemical detection methodologies in collaboration with the industry and stakeholders in agriculture;

2) studies on factors affecting the survival of *Listeria monocytogenes* in agro-ecosystems have provided interesting new information on specific abiotic and biotic soil factors significant for *Listeria* survival. Further, the discovery of cell-to-cell communication as a significant factor for *Listeria* survival, even at "low" cell densities, opens for interesting new basic questions concerning the role of communication systems even on bacterial colonization strategies in soil;

3) infection microbiology of *Candida albicans* with specific attention to the transition from commensalism to pathogenicity. These projects are interesting and provide novel information on the biology of *Candida* infection but, apart from the last study on persistence in soil,they have little relation to agro-ecology;

4) ecology and ecological engineering embraces a series of projects addressing interactions between host and parasites, and even investigates biological invasions and spread of different organisms. The ecology and engineering projects contribute to developing bioindicators to monitor the impact of contamination and management practises on microbial populations.

The publication record of MERS team is very good considering the publication of 82 papers in peer reviewed international journals and an average productivity of 2.34 papers per researcher per year. Publications appear primarily in good or fine journals with 56% of the papers in journals in the first quartile (6 papers with impact >6.8) and an average impact factor of 3.12.). 57% of the papers have a member of the team in the first, the second or the last position in the author list.

Short appreciation on this criterion

The overall assessment of this point is very good. The MERS team has developed a strong methodological and conceptual platform with huge potential to develop further scientific excellence. However research topics are currently somewhat scattered. The strategy for the projects of the MERS team is not visible in the description of the future BIOmE team and a future focus on the ecology of human pathogens in soil, and on the spread of antibiotic resistance in the soil reservoir will be important for integration.

Assessment of the team academic reputation and appeal

The MERS team has a fine platform of research projects. The team participates in the EU project "Snowman" and coordinates the ETN training network List-MAPS. Furthermore the team is involved in 7 other national or regional research projects that offer opportunities for research, training as well as transfer of technology to relevant stakeholders. Hence, the team has developed a good reputation and a good network, both in France and at the international level. Their partners count universities, governmental agencies and private corporations. The MERS team has had research collaboration with partners in 15 countries worldwide.

The MERS team members have organized at least three national symposia and workshops and consolidated their network through hosting visits of 4 top researchers from Canada, Ireland and Italy. MERS team members serve as editors for Frontiers in Microbiology and Cellular & Infection Microbiology, which are both renown international journals with IF of 4.0 and 3.7, respectively. Furthermore, team members serve as reviewers for 15 international journals, which are all renown international journals with IF between 2.2 and 5.5. Finally, team members have made significant contributions as reviewers of research proposals and PhD theses, and as members of hiring committees.

Short appreciation on this criterion

The overall assessment is very good to excellent. The (small) team has developed a strong reputation by contributing to international and national research programs, and has recently taken leadership in a European network. The staff is very active in journal editing and reviewing, and in project/program evaluation.

Assessment of the team interaction with the social, economic and cultural environment

The MERS team contributes very significantly to technology transfer at the national and international level. This happens via joint projects but even through dissemination via meetings and networks targeting e.g. farmers, professional farming organizations, and technical institutes.

The products (rhizobial inoculants) as well as the methods (electrochemical sensors and monitoring methods) that are developed build on state-of-the art expertise in the MERS team. A rapid, electrochemical method to identify and enumerate antibiotic resistant bacteria has been patented and other tools are currently considered for potential

patenting. The utility of the electrochemical method is documented by grants for a follow up PhD fellowship awarded by Lyonnaise des Eaux.

As biological solutions in agriculture are an area attracting considerable attention from industry, the rhizobial inoculants are considered as useful products, as documented by licence agreements with major companies in the BioAg sector (Novozymes, Monsanto, BASF). Finally a series of collaborative projects in the biomedical area involve collaboration with major companies (Pfizer, Sandofi Avensis etc) as well as with smaller companies (GenXpro, Biofilm control).

Short appreciation on this criterion

The overall assessment of this point is excellent. The team has a very strong collaborative network involving collaboration and technology transfer with biomedical and bioag industry. Further the team has close connections to regional stakeholders in agriculture. The diversity of partners is considered useful for future innovation projects as well as for future EU funding requiring SME participation.

Assessment of the team involvement in training through research

The team clearly has a higher than average involvement in teaching and training activities. They have trained 7 PhD students and currently coordinate one ETN network. 4 PhDs were defended, and PhD students published a mean of 3.2 papers ACL with 2 as first author. 3 of the PhDs are currently in public (2) or private (1) research. The team contributes teaching courses to 2 master programmes at the Burgundi University. The team coordinates one module at AgroSup Dijon. They have hosted ca 20 M.Sc. or B.Sc students for internships.

Short appreciation on this criterion

MERS contributes significantly to training through research. The overall assessment of this criterion is excellent.

C. Assessment of the strategy and the five-year plan (BIOmE)

The proposed team on "Biology and Ecosystemic Functions of Soil" in brief sets out to monitor management strategies on soil ecosystem functioning and to develop agro-ecosystem engineering strategies for sustainable agriculture. Such an ambition requires a cross-disciplinary approach able to integrate knowledge across scales and biological organization levels.

As BIOmE represents a further development of research performed by the current EcolDur microbiology team combined with soil microbiological expertise from the current MERS team, the required expertise is in place. Hence, the strong focus of the soil group on understanding the role of biodiversity and biotic interactions in ecosystem functioning is reaffirmed. As the future team is focused on soil, and especially soil microbiology, it needs to be made clear how the team will integrate soil microbiology in the design of innovative cropping systems.

The aims of the BIOmE team represent an evolution of the aims of the current teams. The expert committee agrees with this evolution. Hence BIOmE emphasizes:

- aim 1) not only to understand biodiversity and biotic interactions in the soil, but also to use this knowledge to ensure and optimize the ecosystems that depend on biodiversity and biotic interactions. This additional aim appears realistic considering the progress obtained by the current teams;

- aim 2) to evaluate and monitor impact of agroecosystem management on soil ecosystem functions. This aim is maintained from the current teams;

- aim 3) to develop ecological engineering approaches to promote soil ecosystem functions, which is a novel aim that appears as a logical move further, considering the knowledge already obtained on the significance on soil parameters for soil biodiversity and soil function.

BIOmE suggests focusing on important ecosystem services that are very pertinent (Climate change, C and N cycles, disease regulation, soil+water regulation). These choices reflect current societal concerns and priorities, and the BIOmE team has the expertise to address them. The selected topics fall within areas where there are many players within Inra, and the future team should carefully consider their niche and position as compared to those of others.

The integration of the parts of MERS that address the risk of environmental dissemination of pathogens and antibiotic resistance determinants as well as the adaptation of these microorganisms to the soil environment is a prudent move. This is because considerable expertise in soil microbial ecology, soil microbiomes and in the fate of e.g. veterinary antibiotics is available from the current EcolDur team and future synergies can be expected.

Short appreciation on this criterion

Overall, the expert committee agrees with the evolution towards a soil microbiology focused team, and emphasizes the importance for the team to integrate soil microbiology in the design of innovative cropping systems. Based largely on the detailed project presented during the site visit, the project is assessed as excellent.

Conclusion (BIOmE)

- Strengths and opportunities:

The team has a strong international reputation based on solid research and involvement in the national and international research communities.

The team brings highly innovative approaches to research questions, with a strong emphasis on linking microbial communities to important soil functions and ecosystem services, and the study of soil microbial communities at different spatial scales.

- Weaknesses and threats:

Consideration of soil microbial processes and functions in the design of innovative cropping systems at the UMR level appears to be relatively modest.

- Recommendations:

Develop and support research activities that will ensure the consideration of soil microbial processes and functions in the design of innovative cropping systems.

Ensure that the work on fate and spread of pathogens and antibiotic resistance determinants are fully integrated in projects on the soil microbiome.

Team: GESTAD "Sustainable Management of Arable Weeds"

Name of team leader: Ms Sandrine PETIT-MICHAUT

Team scientific domains

Agroecology; Farm systems design; Landscape ecology; Weed ecology.

Workforce

GESTAD Team workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions		14
N2: Permanent researchers from Institutions and similar positions		12
N3: Other permanent staff (technicians and administrative personnel)		20
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers (Emeritus Research Director, Postdoctoral scientists, visitors, etc.)		
N6: Other contractual staff (technicians and administrative personnel)		
N7: PhD students		
TOTAL N1 to N7		
Qualified research supervisors (HDR) or similar positions		

• Detailed assessments

The GESTAD team is a new team created for the next mandate. It evolves as a continuation of the weed group that formed an important part of the EcolDur team, of which the assessment was already provided in a previous section. For this reason, the evaluation is restricted to an assessment of the strategy of the five-year plan.

Assessment of the strategy and the five-year plan (Gestad team only)

The GESTAD team combines fundamental ecological research, at the landscape scale, with the more applied evaluation and design of agro ecological systems. The combination of analysis and design at this spatial scale is unique. The team is formed from different groups studying weed genetics, weed ecology, weed management and farm systems. These now form a unique set of expertise addressing weed biology and management at a wide range of organizational (genes to communities), temporal and spatial (local to landscape) scales. With an overall focus on sustainable weed management, research will address spatio-temporal dynamics of weeds, weed ecosystem services, bioregulation of populations and the evaluation and design of agroecological systems. This forms a coherent and challenging programme that should result in significant advances to the science that, in turn, will lead to progress in agriculture.

Working at different levels of complexity and at a range of spatial scales, as proposed, should give robust insights into ecological interactions that can contribute to designing sustainable production systems. The strong focus

on weeds from scientific, agronomic and environmental perspectives, using the range of skills across the team, should allow integrated programmes to flourish. This is essential for providing balanced answers to complex, multifactorial issues that make up agroecosystems.

The team has a range of skills and expertise that contribute to cross-discipline work, including strong expertise in the modelling of farm systems. Integration between applied and fundamental research is one of the strongest points of the team. This will be enhanced by the integration and use of the local experimental facilities (UE Epoisses and Fenay sites) utilising large scale as well as plot scale arenas.

The team already contributes to a number of national and international networks and research programmes, and is already in a position of scientific leadership. This should continue. Potential added value should result from working in environmental sciences (Biogeosciences, Chrono-environment), economics and sociology (Cesear) and geography (ThéMA). This should benefit from the success of the I-Site project.

The team will address four axes: spatio-temporal dynamics of weeds in landscape mosaics, weed services (trophic resources in crop production), biological regulation of weeds and the evaluation and design of agroecological systems. Again, the overall aim of designing sustainable weed management and production systems is coherent, challenging but achievable.

Short appreciation on this criterion

The size of the group and the width and depth with which the weed topic is covered is unprecedented in Europe, and probably in the world. The team includes highly respected scientists with international reputations. The team does dynamic science with innovative scientists who bring a range of skills and a broad ecological outlook to complex problems. The expert committee evaluates the team as outstanding for this criterion.

Conclusion (GestAd only)

- Strengths and opportunities:

The team has a strong international reputation. The team brings innovative approaches to research questions. The strong focus on weeds provides a coherent, easily recognised programme that benefits from the complementarity and wide range of skills present in the team. Both basic and more applied work is a strong feature. The team has excellent modelling skills, combined with good experimental facilities for evaluation and long-term field studies. They have the expertise and incentive to integrate the gained knowledge into the design of new management systems. Many projects are within the scope of current societal issues, potentially increasing the opportunities for funding. The team has good connections with stakeholders and farmers, helping to focus on relevant applied issues, and some lines of research will have immediate or short-term practical application. There is a strong scientific leadership in the team, and a willingness to collaborate with the other teams within the unit, as is evident from their involvement and leading role in the theme-based scientific workshops.

- Weaknesses and threats:

Potential threats may come from external competition (less likely with the critical mass achieved), and the high cost of large-scale experimental facilities with a shift from recurrent to project-based funding. The team needs to continue to lead the overall UMR theme, so that there is coherence across the unit, for example including legumes in system design and development.

- Recommendations:

Continue to focus on ecology and consider higher trophic levels for trait approaches and services in the design of sustainable systems. Continue to provide leadership in the transverse workshops across the unit and develop connections with the other UMR teams. Within the team, maintain communication and innovation across the subgroups.

Team: GEAPSI "Genetic and Environmental determinisms of the Adaptation of Plants to Innovative cropping Systems"

Name of team leader: Mr Christophe SALON

Team scientific domains

GEAPSI aims at improving the scientific knowledge on key factors underlying the adaptation of cultivated and weed species, mainly Legumes, in order to contribute for new cropping systems based on improved genotypes. Research is carried out on model plant (A. thaliana, M. truncatula) as well as on agronomic crop, pea, and faba beans. The GEAPSI team is involved in the following thematic areas:

- soil resource uptake (N S) with interaction of soil microflora and abiotic stresses;

- identification and functioning of important genes for seed composition under stress conditions (heat – water);

- genetic basis of weed adaptation, using functional and life history traits approaches; this part is performed in collaboration with the EcolDur team.

Workforce

GEAPSI Team workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	3	3
N2: Permanent researchers from Institutions and similar positions	15	11
N3: Other permanent staff (technicians and administrative personnel)	36	36
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers (Emeritus Research Director, Postdoctoral scientists, visitors, etc.)	1	
N6: Other contractual staff (technicians and administrative personnel)	8	
N7: PhD students	7	
TOTAL N1 to N7	**70**	
Qualified research supervisors (HDR) or similar positions	10	

• Detailed assessments

Assessment of scientific quality and outputs

The originality of GEAPSI team researches stands on the cross-fertilisation between genetics, eco-physiological and physiological approaches. Very efficient tools have been developed for genetic studies and for high throughput plant phenotyping, especially roots. Very important effort was done on the development of an efficient HTP phenotyping platform for plants and microorganism interactions and root phenotyping (PPHD platform). The most innovative part of this work was patented (2 patents on root tubes and cab systems). The GEPSI team is also

responsible for the biological resources for Legume species including breeding materials or dedicated RILs, genetic resources of Pea and Faba accessions, dedicated collections for stress and GWAS studies (Pea), tilling and insertion mutant populations for genomic studies and functional validation. In parallel, modelling tools have been used to predict the nodulation root system of Pea, and the resistance to cold temperature. The GEAPSI team made the following significant contributions:

- advances have been achieved on root and nodule architecture versus N uptake and *Rhizobium* genotype preference. Among many other results, we noted the fine description of a mutant (TR185) showing a highly root-branched root architecture, which mimics the N-starvation phenotype, and confirms modifications in nitrate assimilation metabolic pathways. Another mutant identified in the *M. truncatula* insertion collection with long-tap roots and modified shoot/root ratio was confirmed to correspond to an insertion in a PPIAse gene. Large variations were observed for N uptake and *Rhizobium* genotype preference in a core collection of Pea. Hypernodulating mutant lines were identified without loss of symbiotic fixation;

- important bodies of results have been obtained in collaboration with the EcolDur team on *M. Truncatula* based on multidisciplinary approaches to characterise how *M. truncatula* genotypes are able to shape the soil microbes communities according to N availability. Increasing CO2 concentration in presence of *Pseudomonas fluorescens* can accelerate plant development and mycorrhization during vegetative stages. Various results were obtained on pea responses under stress conditions, where the diversity of the soil community was shown to improve the resilience to water stress during the recovery period. As the development of winter pea varieties represents an alternate strategy to ensure production of plant proteins facing to climatic change, genetic mapping studies have been carried out in different environments to identify QTLs associated to tolerance to frost, independent of phenology and morphology traits in Pea (*Hr* & *Le* Loci), which are promising to better understand cold tolerance and improve cultivars;

- better understanding of the consequences of sulphur deprivation on the remobilization of photosynthate from sources to seeds has been obtained, which relies on the vacuolar sulfate transporter *SULTR4* activities. More generally sulphur metabolism and *SULTR* genes were confirmed to improve sulphate transport, and are a promising way to improve plant response to water stress;

- important results using genomics resources of *M. truncatula* and *P. sativum* allowed for the identification of a syntenic region involved in seed weight and protein composition. A candidate approach focused on a transcription factor *DASH* and a *Subtilase SBT1_1* as they colocalized with seed weight QTLs. Functional validation was obtained for these 2 genes by using tiling and Insertion mutants. GWAS studies were also performed to identify syntenic regions involved in seed protein content, and composition with a more specific interest for saponin and lipoxigenase that can alter Pea and Faba seed flour with undesirable flavours. Genotyping of various collections of Pea by SNPs was carried out to initiate genomic selection and to check the accuracy of prediction of important agronomic traits such as flowering date, seed number and seed weight;

- on weeds, transcriptomic NGS Technology were developed to unravel the basis of non target-site herbicide resistance of blackgrass and ryegrass. Trade-off between adaptation to herbicide resistance versus fitness losses was also evaluated. Other research on genetic diversity and functional adaptation of weeds are presented using different models (*P. rhoeas*, *P. racemosa*), and other approaches such as life history traits, population genetics to better characterize the potential of adaptation of weeds. The collaboration with the EcolDur team, and also, at the unit scale, with Theme-based Scientific Workshop activities, highlight the dynamics of weed adaptation that results predominantly from high phenotypic plasticity to respond to man-perturbed agro-ecosystems.

Overall, the scientific production of the team represents 108 ACL (1,48 papers/main scientists/year) in a 3 to 6 range of IFs for most of them and representing fairly well the scope of thematic areas developed by GEAPSI. 78% of the papers have a member of the team in the first, the second or the last position in the author list.

Short appreciation on this criterion

The GEAPSI team contributes to researches on Legume genetics, on the comprehension of eco-physiological plant responses to abiotic stress (drought, nutrition deficiences and thermic stresses), on the plant interaction with soil microbial communities, on the development and quality of seeds, and on the genetic and functional diversity of weeds. The originality of GEAPSI team research stands in the cross-fertilisation between genetics, eco-physiological and physiological approaches. GEAPSI scientific quality and output is very good.

Assessment of the team academic reputation and appeal

The team has a key role in several ambitious projects, at the national and international levels.

GEAPSI is involved in:

- several networks, at the national (EA, BAP, SPE and Inra departements, GIS BV, "Groupe filière", etc.);

- two COST actions (for genetic and phenotyping, respectively).

GEAPSI is in charge and is coordinating large projects supported by the French PIA initiative (PeaMUST) or ANR GENOPEA, and EC-KBBE LEGATO, which give to the team a central role in genomics of Pea and Faba at the international level. In addition, the group is participating to 3 other EU projects (ABSTRESS, MEDILEG, EPPN and to another PIA project (Phenome).

The team is also a member of national or European scientific or professional networks (11 including 2 European Cost Actions). GEAPSI hosted the 4th national Seed conference organized by the National Seed Biology Network and the GIS Agrale in 2013. GEAPSI organized a multidisciplinary workshop on *"The future of legumes in human nutrition".*

Member(s) of GEAPSI:

- has received a prize from the "pôle de compétitivité" in 2013;

- have given 30 invited lectures and communications in international Conferences (7th International Conference on Legume Genetics and Genomics, Canada, European Weed Society Research, Germany, PAG, USA, among others);

- have contributed to 16 scientific (3) or organisation committees (14) in national or international conferences;

- High number of invitations (37) of the group leaders;

- high number of communications and posters in national and international conferences;

- are member of editorial committees related to their scientific domains (Plant Cell Tissue Organ Culture, The International Journal of Plant Biology). Most of the GEAPSI Scientists (14) are regularly reviewing manuscripts of international journals in Genetics, Plant physiology, Ecology, Weed Science, etc.).

GEAPSI expertise is also regularly requested for the evaluation of proposal and projects reviews (14) for international and National Agencies (ANR, FRB).

Short appreciation on this criterion

The GEAPSI academic reputation and appeal is excellent to outstanding.

Assessment of the team interaction with the social, economic and cultural environment

Methodological aspects in Phenotyping Platform are important key-points of team activities. The PPHT has been developed with 2 SMEs (inovaflow and Skakti) and innovative rhizotrons and imaging cabin (rhyzotubes HT and rhyzocab) that have been patented. More recently 2 other patents are being filed for the development of new imaging analysis tools and new systems of stroboscopic LED lightning.

During the first mandate of the unit, GEAPSI made excellent dissemination efforts (34 syntheses intended to the professional audience) with the organisation of several (13) workshops with partners, and the organization of summer school on phenotyping and 4 contributions to public debate and 3 to TV programs, 8 other medias. The team produced and spent time for large audience publications (6) and professional links in the domains of herbicide use, development of pea growing conditions and varieties, agroecology (30), etc. GEAPSI team participated to national events for Science popularization ("Fête de la Science; Nuit des Chercheurs") and scholar visits of the station.

The team has developed a very important network of collaborations with socio-economic partners. GEAPSI developed long term partnerships with two technical institutes, breeders, inter-professional organisations, Teaching and with 4 majors plant protection companies and two large SME for oil production.

Short appreciation on this criterion

GEAPSI has developed an outstanding set of interactions with its social, economic and cultural environment.

Assessment of the team involvement in training through research

The team was deeply involved in hosting master students from the Bourgogne University for their internship (13 M2 and 4 M1 – M2 B2IPME). GEAPSY has organized also training sessions and has prepared contents and syllabus for M2 modules (plan biotechnology) or dedicated training Workshop ("Alimentation humaine et Légumineuses", Conception d'ideotypes, Weed biology). Scientists are also participating actively to various PhD (21) or HDR (4) defence committees and to E2S Doctoral School of the University of Bourgogne. The very good training by research can be assessed through the number of Engineers 11), Erasmus (2), masters (26; 10 M2) and bachelors (8) or lower levels (13) who have been hosted in the team.

6 PhD Thesis were defended during the contract with 2 foreigner students in the frame of collaboration projects. All PhD had ACL publications with their supervisor and communications to meetings.

Short appreciation on this criterion

Although the contribution to training and implication in Bourgogne University is good to very good, the global Involvement in training through research is good. The team has probably the capacity to increase the number of PhD students in relation to the large number of team HDRs (10) and of on-going projects and programs.

Assessment of the strategy and the five-year plan

The team wishes to take advantage of its recognition within the Pea Consortium and of the central role played by the Federative PIA Project (PeaMUST). There is now a wealth of genomic and biological resources ready for exploitation and for future focus. Considerations on environmental interactions (abiotic stresses – plant-microorganism interactions) and use of biodiversity to guide the research activities will be priorities in view of varietal innovation. The movement of research group working on weed adaptation (presently included in GEAPSI) towards the new GESTAD team more dedicated to the management of weeds is in line with the moderate added value of research on weeds in the GEAPSI team.

Therefore, the new GEAPSI team should be able to reinforce its heart of skills and activities, namely genetics – genomics and ecophysiology of Pea, with the help of *M. truncatula.*

Priorities are in the continuation of current activities:

- the tolerance to hydric stress in link with the N Uptake and mobilization and interaction with soil microorganisms;

- sulphur metabolism and its interaction with hydric stress and N remobilisation;

- the seed composition for food and feed use, to identify important factors of seed quality required for improvement of pea flour.

An important contribution is also planned with respect to modelling of nodulated root growth and architecture activities based on an existing model (Pea-Nod model), and extension to other legumes in order to simulate and test the N dynamics in crop rotation.

Short appreciation on this criterion

The team project mostly corresponds to ongoing research and funded projects. It thus appears as a sound and feasible project, relying on a good strategy in line with the investments and methodological developments undertaken during the previous period to capitalize on in the next contract for increasing impact of science and publications. Presently, the interdisciplinarity is mostly viewed through "theme-based scientific workshops". This may be not enough for reinforcing transversal studies within the unit and developing an integrated view of AgroEcology that can be recognised at the national and international levels. There are thus opportunities to focus more on a limited number of objectives and to develop a more consistent view of agroecology in the unit.

The project is very good.

Conclusion

- Strengths and opportunities:

Excellent international reputation in the scientific community (French and European).

Excellent relationships with the professional world of the grain legume value chain, with new opportunities to continue collaborations, joint projects and new funding supports.

Excellent partnership with private non-academic partners.

Excellent visibility of the HTPP platform that should open new opportunities.

Very high quality genetic and genomics resources and on-going projects to capitalize on in the next contract, for increasing impact of science and publications.

Good potential integration in the recently accepted I-SITE Project.

- Weaknesses and threats:

Lowered efficiency of platform if human resources are reduced due to future retirement of technical staff.

Risk of losing focus with respect to the number of mechanisms and biological processes under study.

Risk of research driven by projects without a general strategy for the pole.

Risk of over-investment and/or solicitation of team members in charge of platforms, resources maintenance and transversal activities (group leaders mainly).

Low number of PhDs and post-docs with respect to the size of the pole.

- Recommendations:

GEAPSI is involved in the study of a large number of mechanisms and biological processes linked to plant legumes development, nutrition and adaptation to abiotic stresses. The results obtained are of good quality. However, defining priorities among those mechanisms and processes could help avoiding a risk of dispersion. The complementary of skills in presence within the team should allow more inter-discisplinarity projects that still need to be reinforced in the next period. Also, some effort should be made to improve the integration of research on the model plant *M. trunculata* and of modeling activities with finalised objectives (legume breeding). In addition, the links with the AgroEcology theme should be significantly reinforced as well as those with the other poles of the unit, especially the Biome team, in order to enhance and demonstrate the key role of Legume crops in sustainable agrosystems.

The GEAPSI team has certainly the capability to reinforce its appeal for PhD students, in relation to the HdR capacity, and to improve its publication strategy, based on the innovative results obtained.

5 • Conduct of the visit

Visit dates

Start: Tuesday the 19th January 2016 at 8:30 am

End: Thursday the 21st January 2016 at 01:00 pm

Visit site:

Institution: Inra

Address: 17 rue Sully, 21000 Dijon

Conduct of the visit:

The 19th january 2016

08:30 am	Welcome
08:45 am	Closed-door expert committee meeting; principles and modalites of the evaluation
09:15 am	HCERES scientific advisor: the role and procedures of HCERES
09:30 am	Unit past activities and project for the next contract (discussion)
11:00 am	Break
11:30 am	Team GEAPSI, past activities and project for the next contract (discussion)
01:30 pm	Lunch buffet, and close-door meeting of the expert committee
02:30 pm	Team IPM, past activities and project for the next contract (discussion)
04:30 pm	Theme-based scientific workshop; design of cropping systems (discussion)
05:15 pm	Theme-based scientific workshops: interactions between modeling and experiments/observations
06:00 pm	Close-door meeting of the expert committee
07:00 pm	End of the visit for the 19/01

The 20th january 2016

08:30 am	Team MERS, past activities (discussion)
10:00 am	Break
10:30 am	Team EcolDur, past activities (discussion)
12:00 pm	Team BIOmE, project for the next contract (discussion)
12:40 pm	Team GESTAD, project for the next contract (discussion)
01:20 pm	Meeting with the representatives of the 3 managing bodies
02:00 pm	Lunch buffet
03:00 pm	Meeting with the permanent researchers and teachers
03:45 pm	Meeting with the permanent engineers, technicians, administratives
04:30 pm	Discussions with students, post-docs and temporary staff
05:15 pm	Discussion with the head of the doctoral school

05:45 pm	Discussion with the head of the unit
06:15 pm	End of the visit for the 20th

The 21th january 2016

08:30 am	Close-door meeting of the expert committee
12:00 pm	Lunch tray
01:00 pm	End of the visit

6 • Supervising bodies' general comments

HCERES
20, Rue Vivienne
75002 Paris

Dijon, le 11 mai 2016

Numéro et nom du rapport d'évaluation : S2PUR170011911 - AGROECOLOGIE - 0755361V

Objet : Observations générales

Madame, Monsieur,

Nous sommes très reconnaissants à la Commission HCERES pour le rapport d'évaluation de notre UMR et les recommandations formulées dont nous tiendrons le plus grand compte.

Nous nous permettons toutefois de faire les observations générales suivantes sur quelques points qui ont attiré notre attention.

Une observation sur la structure générale du rapport qui ne donne pas le même statut aux nouveaux pôles BIOmE et GESTAD et qui ne fait pas un bilan des pôles EcolDur et MERS à parts entières, le nom de ses responsables (respectivement Laurent Philippot et Alain Hartmann) ne figure d'ailleurs pas. Ainsi p. 19, le nom du pôle devrait être EcolDur au vu des domaines scientifiques et du tableau workforce indiqués, et en conséquence le nom du responsable devrait être Laurent Philippot. De même, le projet de pôle GESTAD fait l'objet d'une présentation complète p. 25 (Team, Team scientific domains worforce, detailed assessments) et non le projet de pôle BIOmE.

Au vu de ces commentaires, nous proposons les suggestions suivantes (indiquées également dans fichier erreurs factuelles) :

p. 19. Un besoin de clarification nous semble nécessaire pour spécifier le bilan des pôles actuels EcolDur et MERS et ensuite les projets pôles BIOmE et GESTAD résultant de l'évolution des pôles de l'Unité.
De façon plus spécifique:
Title, remplacer 'BIOmE Biology and Ecosystemic functions of soils' by 'EcolDur Community Ecology and Sustainabillity of Framing Systems'
Name of Team leader, remplacer 'Fabrice Martin-Laurent' par 'Laurent Philippot'
'Detailed assessment' afin de clarifier l'évolution du pôle EcolDur en deux pôles (BIOmE et GESTAD) pour le nouveau projet d'UMR, nous suggérons d'ajouter au début de la section 'Detailed assessments' la phrase suivante : 'Les recherches en écologie microbienne du pôle EcolDur seront conduites dans le nouveau projet au sein du futur pôle BIOmE qui inclura également les recherches en écologie microbienne de l'ex-pôle MERS, tandis que les recherches sur les adventices du pôle EcolDur seront conduites au sein du futur pôle GESTAD qui inclura également la génétique des adventices précédemment rattachée au pôle GEAPSI'.
p. 20. Supprimer le sous-titre 'A. Detailled assessments for 'Community Ecology and Sustainability of Farming Systems (EcolDur)'
p. 21. Pour le pôle MERS reprendre le même format que pour les autres pôles et indiquer :
Team MERS 'Environmental Microbiology and Health risks'
Name of the team leader : Mr Alain Hartmann
Work force :

MERS workforce	Number on 30/06/2015 1	
N1: Permanent professors and similar positions	13	
N2: Permanent researchers from Institutions and similar positions	1	
N3: Other permanent staff (technicians and administrative personnel)	5	
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)	0	
N5: Other researchers (Emeritus Research Director, Postdoctoral scientists, visitors, etc.)	2	
N6: Other contractual staff (technicians and administrative personnel)	2	
N7: PhD students	4	
	27	
Qualified research supervisors (HDR) or similar positions	8	

p. 23. Le format de présentation du projet de pôle BIOmE devrait être analogue à celui du projet de pôle GESTAD à savoir :
Team : BIOmE "Biology and Ecosystemic functions of soils"
Name of team leader : Mr Fabrice Martin-Laurent', '
Workforce

BioME workforce	Number on 30/06/2015 1	Number on 01/01/2017 2 On the bases of those present on 30/06/15
N1: Permanent professors and similar positions		9
N2: Permanent researchers from Institutions and similar positions		10
N3: Other permanent staff (technicians and administrative personnel)		14
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		0
N5: Other researchers (Emeritus Research Director, Postdoctoral scientists, visitors, etc.)		0
N6: Other contractual staff (technicians and administrative personnel)		0
N7: PhD students		2
TOTAL N1 to N7		35
Qualified research supervisors (HDR) or similar positions		10

p. 26. Finalement, la phrase indiquée dans 'Stengths and opportunities du projet de pôle GESTAD' *'The team needs to continue to lead the overall UMR theme, so that there is coherence across the unit, for example including legumes in system design and development'* nous interpelle car aucun pôle plus qu'un autre n'assure la cohérence de l'Unité, il s'agit bien d'une contribution collective.

Outre ce commentaire relatif à la structure du rapport, nous nous permettons de formuler **les observations plus spécifiques suivantes** :

- Il est fait référence dans le rapport au *'lack of capacity to promote, stimulate, and encourage the different groups/teams of the unit to develop'*. Même si nous acceptons le principe qu'il existe une marge de progrès, les instances mises en place au sein de l'Unité (Ateliers Scientifiques Thématiques, Cellule d'Animation Scientifique, Cellule de Partenariat) ainsi que les actions entreprises (en particulier politique scientifique incitative) ont pour vocation de promouvoir les interactions entre pôles et l'émergence de projets communs. Cette politique se concrétise par la co-direction de thèses et post-doc, de projets transversaux (ANR, PSDR, PIA) et se traduit par des publications communes.
- Il est également fait référence au manque de clarté des rôles, de la composition des instances de gouvernance de l'UMR et de leur redondance *'many committees (CoDir, ARPPE- assembly of the team, platforms and groups-, scientific committee, Scientific animation group, unit committee) and cells proposed by the governance chart, whose roles and compositions are not always clearly defined and seem sometimes redundant'*. Nous souhaitons rappeler que les missions et compositions de ces instances sont indiquées dans le dossier HCERES avec des indications de leurs spécificités voire complémentarités (pp. 10-11). La constitution de ces instances résulte d'un long travail de construction collective initié avant même la création de l'UMR et répondant aux attentes de l'Unité voire des tutelles (réponse au commentaire fait p. 10). Par

contre, afin de tenir compte des observations formulées par la Commission, les missions, compositions et interactions entre les différentes instances seront rappelées aux collègues dans un vade-mecum du fonctionnement de l'Unité (même si la plupart des informations correspondantes sont disponibles dans le site intranet de l'UMR).

- *'the procedures for allocating and using the financial resources (contracts, support from parent institutes)'.* Nous sommes également surpris par ce commentaire car la totalité de la dotation de base est mutualisée et permet la prise en charge des dépenses de fonctionnement collectif (fluides, animation scientifique, formation, politique scientifique, maintenance des équipements...) ; les ressources sur contrats sont gérés par les scientifiques coordinateurs avec l'appui des gestionnaires financières et RH avec sollicitation de contribution au fonctionnement laissé à l'appréciation du coordinateur et selon l'éligibilité de la dépense. Ce mode de fonctionnement a fait l'objet d'une réflexion collective et de communications au sein de l'UMR lors d'Assemblées Générales et de Conseils de Service.
- *However, particular attention should be paid to undertaking annual interviews of the technical staff involving the direct line manager and checking that the requirements of each of the parent institutes have been taken into account, in order to ensure an objective assessment of the personnel applications during highly selective promotion reviews and processes.* Des rencontres systématiques avec l'ensemble des personnels ITA et Biatoss de l'Unité et leurs responsables ont lieu annuellement, représentant un temps d'échanges sur les activités et objectifs, destiné entre autres à les accompagner au mieux pour l'évolution de leur carrière.
- Finalement, nous avons été très sensibles aux propos tout à fait élogieux sur le projet d'Unité dans son ensemble et sur les projets de chacun des pôles avec des appréciations allant d'excellent à outstanding, l'appréciation finale 'very good' du projet d'unité aurait pu être mieux justifiée en précisant les pistes d'améliorations."

En remerciant à nouveau sincèrement la Commission HCERES pour le travail effectué, nous vous prions d'agréer, Madame, Monsieur, l'expression de nos salutations distinguées.

Philippe LEMANCEAU
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