APPENDIX / ANNEXE

Publications / Publications

***Acronym of the Project* / Acronyme du projet**	SPECIFICS
Project title (in English)	Sustainable Pest Control In Fabaceae-rich Innovative Cropping Systems
Titre du projet (en français)	Conception de systèmes de culture sans pesticides et riches en légumineuses à graines

Name of the entity:

UMR Agroécologie, INRA BFC

List of publications in chronological order:

Scientific peer-reviewed journal

Adeux, G., Giuliano, S., **Cordeau, S**., Savoie, J.-M., Alletto, L., 2017. Low-input maize-based cropping systems implementing IWM match conventional maize monoculture productivity and weed control. Agriculture 7, 74. https://doi.org/10.3390/agriculture7090074

Adeux, G., **Munier-Jolain, N**., Meunier, D., **Farcy, P**., Carlesi, S., Barberi, P., **Cordeau, S**., 2019. Diversified grain-based cropping systems provide long term weed control while limiting herbicide use and yield losses. Agron. Sustainable Dev. 39, 42. https://link.springer.com/article/10.1007/s13593-019-0587-x

Adeux, G., **Vieren, E**., Carlesi, S., Bàrberi, P., **Munier-Jolain, N., Cordeau, S**., 2019. Mitigating crop yield losses through weed diversity. Nature Sustainability 2, 1018-1026. https://www.nature.com/articles/s41893-019-0415-y

Bourion V., Heulin-Gotty K., Aubert V., Tisseyre P., **Chabert-Martinello M**., Pervent M., Delaitre C., Vile D., Siol M., Duc G., Brunel B., **Burstin J**., Lepetit M. (2018). Co-inoculation of a pea core-collection with diverse rhizobial strains shows competitiveness for nodulation and efficiency of nitrogen fixation are distinct traits in the interaction. Front. Plant Sci. 8:art. 2249 (10p.).

Carrillo, E., Raffiot, B., **Ollivier, D.,** Deulvot, C., **Magnin-Robert, J. B., Tayeh, N., & Marget, P**. (2018). Identification of novel sources of resistance to seed weevils (Bruchus spp.) in a faba bean germplasm collection. Frontiers in plant science, 9, 1914.

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Colbach, N., Bockstaller, C., Colas, F., Gibot-Leclerc, S., Moreau, D., Pointurier, O., Villerd, J., 2017. Assessing weed-mediated broomrape risk in cropping systems with a simulation-based indicator. Ecological Indicators 82, 280-292.

Colbach, N., Cordeau, S., 2018. Reduced herbicide use does not increase crop yield loss if it is compensated by alternative preventive and curative measures. European Journal of Agronomy 94, 67-78. https://www.sciencedirect.com/science/article/pii/S1161030117301892

Colbach, N., Cordeau, S., Garrido, A., Granger, S., Laughlin, D., Ricci, B., Thomson, F., Messéan, A., 2018. Landsharing vs landsparing: How to reconcile crop production and biodiversity? A

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Name of the entity:

UMR IGEP, INRA Bretagne-Normandie

List of publications in chronological order:

Scientific peer-reviewed journal

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Name of the entity:

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Name of the entity:

UE Epoisses, INRA BFC

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Name of the entity:

UE Bourges, INRA Val de Loire

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Name of the entity:

LISIS, INRA Ile de France

List of publications in chronological order:

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Name of the entity:

APF, INRA – Université de Lille

List of publications in chronological order:

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Beji, S., Fontaine, V., Devaux, R., Thomas, M., Negro, S., Bahrman, N., Siol, M., Aubert, G., Burstin, J., Hilbert, J.-L., **Delbreil, B.**, **Lejeune-Hénaut, I.** (2020) Genome-wide association study identifies favorable SNP alleles and candidate genes for frost tolerance in pea. in revision in BMC Genomics.

Bahrman, N., Hascoët, E., Jaminon, O., Depta, F., Hû, J.-F., Bouchez, O., **Lejeune-Hénaut, I.**, **Delbreil, B.**, and Legrand, S. (2019). Identification of Genes Differentially Expressed in Response to Cold in Pisum sativum Using RNA Sequencing Analyses. Plants, 8(8):288.

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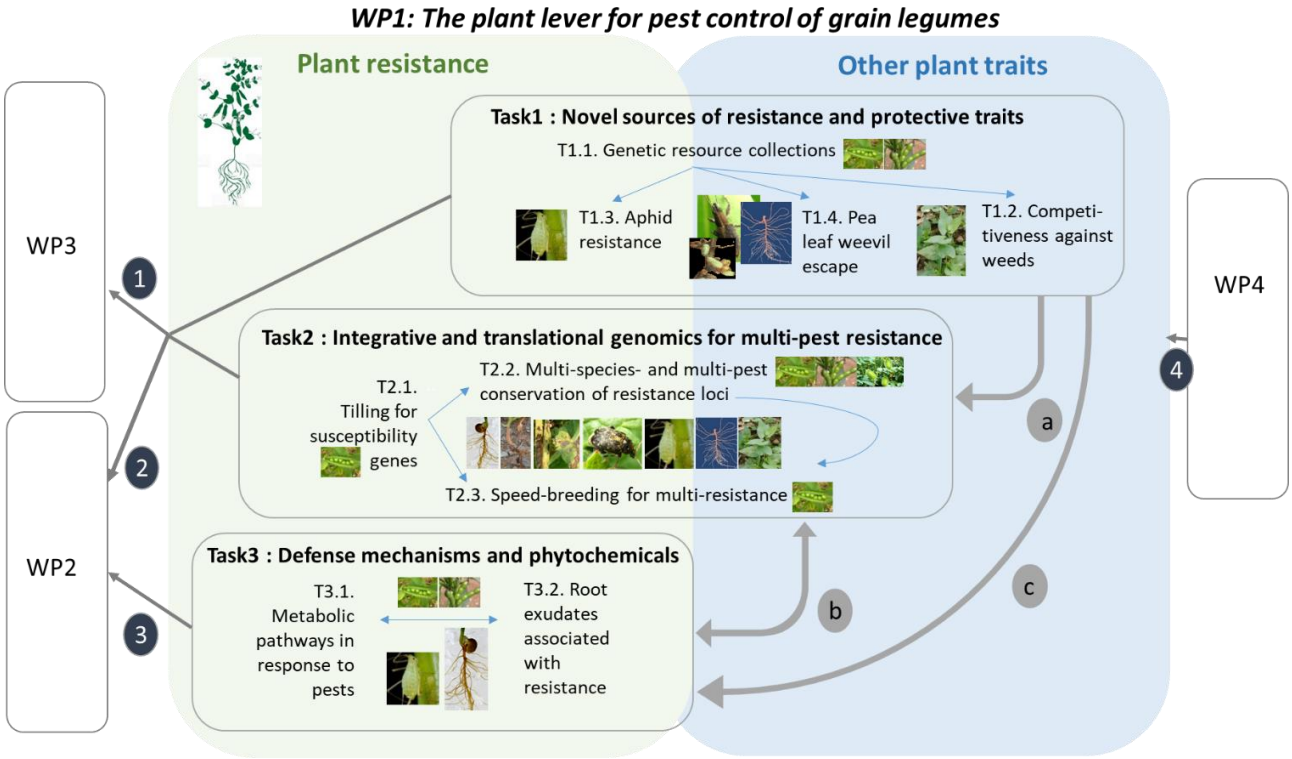
- *Schematic view of scientific WPs and their links*

Overview of WP1



Relationships between tasks of WP1

a. New sources, loci and markers identified for resistance and protective traits from Task1 will be used in Task 2 as genitors in speed breeding and in comparative genomic studies to identify loci and candidate genes with effects on multiple pests in each grain legume and to study conservation of resistance loci between grain legumes
b. Genomic, transcriptomic, metabolomic and phytochemical approaches conducted in Tasks 2 and 3 will be integrated in order to decipher metabolic pathways and functions underlying quantitative resistance to aphanomyces root rot and aphids in pea and faba bean.
c. Resistant and susceptible genotypes to aphids identified in Task1 will be used for transcriptomic and metabolomics assays in Task 3.

Relationships between WP1 and the other WPs

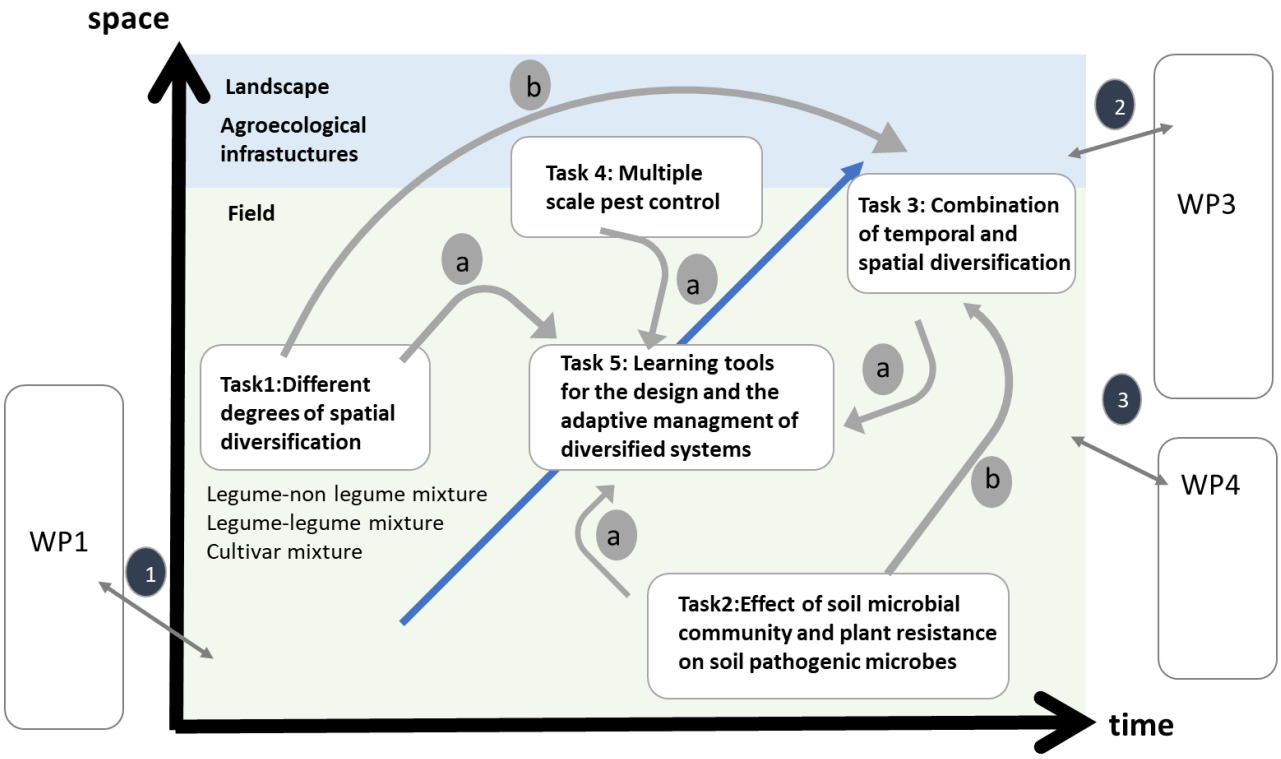
1. Knowledge acquired in WP1 about the plant traits relevant for pest regulation on grain legumes and the effect of their combination in breeding lines, will be used to build indicators for new criteria in the multi-criteria assessment and eco-efficiency analysis of cropping systems conducted in WP3. WP1 will also provide to WP3 expertise and data on aphanomyces root rot, for the analysis of socio-economic processes leading to the development of alternative methods to pesticides when these are not available.
2. New sources of resistance and breeding lines having introgressed genetic loci for multiple pest regulation from WP1 could be evaluated, in pure and mixed cropping, in pesticide-free field trials of WP2. Data obtained in WP1 for plant competitiveness-related traits on various pea and faba bean genotypes will be used to parametrize the FLORSYS model in WP2 for the design of pulse-rich cropping systems promoting biological weed regulation. Knowledge about the conservation of genetic loci controlling resistance to aphanomyces root rot in pea and faba bean will be related

to the durability of resistance to *A. euteiches* observed in an infested field trial of pea and faba bean successions conducted in WP2 with common genotypes to those studied in WP1.

3. Root exudates composition data obtained in WP1 in pea and faba bean genotypes resistant to aphanomyces will be related to soil microorganism composition of infested soils grown with these resistant genotypes in WP2.
4. Contribute to teaching, training, and dissemination (scientific community, stakeholders, public) of WP4

Overview of the WP2

WP2. Intensification of biological regulations at different spatial and temporal scales for pest, disease and weed control in biodiversity-based systems rich in legumes



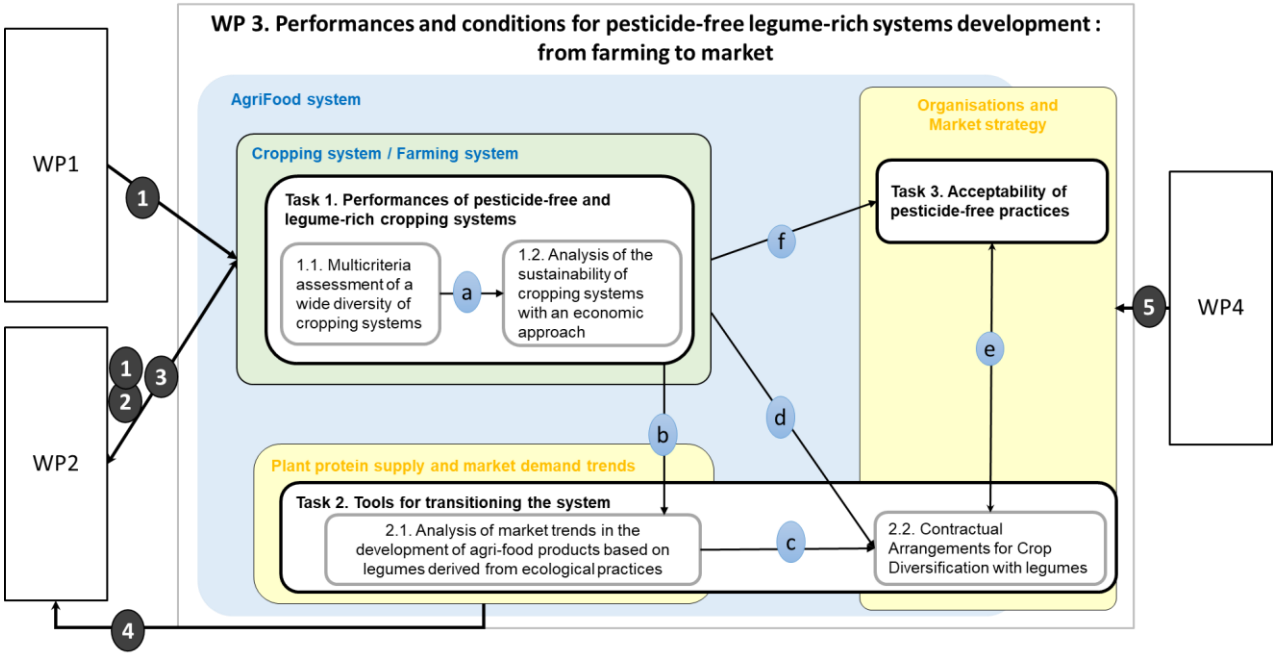
Relationships between tasks of WP2

a. Transformation of scientific knowledge in learning tools
b. Use of knowledge at one scale to better understand strategies combining different scales

Relationships between WP2 and the other WPs

1. With WP1: integration of plant resistance in cropping systems; identification of plant traits essential for innovative cropping systems; interaction between biological regulations and plant resistance
2. With WP3, new indicators to predict the intensity of biological regulations and pest control; prototypes to be assessed at farm and value-chain level
3. Contribute to teaching, training, and dissemination (scientific community, stakeholders, public) of WP4

Overview of the WP3



Relationships between the tasks of the WP3

a. The typology of cropping system, based on the way to introduce legumes in cropping systems and the production situation, is used to compare the systems with each other and identify the most efficient ones.
b. Do market developments seem to be converging and supportive of the development of sustainable and most efficient cropping systems?
c. Do market developments seem to be triggering new market strategies and stakeholder organisations?
d. Is knowledge about the cropping system performances conducive to new forms of contracting and organization?
e. Which organizations to promote acceptability of pesticide-free legume-rich cropping systems?
f. Is the knowledge on the cropping systems performance favourable to the acceptability of pesticide-free legume-rich cropping systems?

Relationships of the WP3 with others WP

1. New assessment criteria are identified to better take into account legumes in the multicriteria assessment and eco-efficiency analysis of cropping systems. Partners' expertise or knowledge produced in the project are synthesised in order to build indicators to inform these new criteria.
2. The knowledge produced on the performances of existing cropping systems is used in co-designing new pesticide-free and legume-rich cropping systems. The multicriteria assessment method and the eco-efficiency analysis built in WP3 to assess farmers cropping system is used to ex-ante assessment of co-designed cropping systems.
3. Generation of virtual innovative farming practices based on agronomic model simulations developed in WP 2.
4. Market trends will provide a view of potential market demand to define some objectives assigned to cropping system design in WP 2.
5. Contribute to teaching, training, and dissemination (scientific community, stakeholders, public) of WP4

- *List of Deliverables and Milestones of SPECIFICS*

Deliverables summary

WP	Task	Name and nature of delivrables (D)	Date of availability (Months)	Partner in charge
1	1.1.1	**D1.1.** Local (a) and GnpIS (b) database with morphological and phenological phenotypic traits	48 (a); 72 (b)	UMR Agroécologie, URGI
1	1.1.2	**D1.2.** Genetic diversity and GWAS loci for stand establishment in relation with weed control	42	IRHS
1	1.1.2	**D1.3**. Ecophysiological characterisation of contrasted pea and faba bean genotypes	48	UMR Agroécologie
1	1.1.3	**D1.4.** GWAS loci and sources for resistance to aphids in faba bean	54	IGEPP
1	1.1.4	**D1.5.** Phenotyping of contrasted faba bean accessions for response to *S. lineatus* and link between nodule and vigor-related traits and nodule damage	72	UMR Agroécologie
1	1.2.1	**D1.6.** Best resistance alleles obtained in pea from TILLING	36	UMR Agroécologie
1	1.2.2	**D1.7.** Bioinformatic protocol for translational genomics PhD manuscript	42	UMR Agroécologie
1	1.2.2	**D1.8.** QTL and candidate genes for resistance to multiple pests in pea (a) and faba bean (b), in relation with plant development and architecture	48 (a); 72 (b)	IGEPP, AFP, UMR Agroécologie
1	1.2.2	**D1.9.** QTL synteny and candidate gene orthology between grain legumes for resistance to weevils (a), aphanomyces root rot (b), aphids (c) and root architecture (d)	48 (a,b,d); 72 (c)	IGEPP, UMR Agroécologie
1	1.2.2	**D1.10.** Integration of QTL, Synteny, GWAS and gene annotations data in a graph (Neo4j database) for pea, faba bean and lentil.	72	URGI
1	1.2.3	**D1.11.** Elite spring pea partially resistant to aphanomyces root rot introgressed with weevil and powdery mildew resistance genes (a) and alleles of interest from tasks 1.2.1/2 (b)	36 (a); 72 (b)	UMR Agroécologie
1	1.3.1	**D1.12.** Genes and metabolic pathways underying a major QTL of resistance to *A. euteiches*in pea, by comparison to faba bean (PhD manuscript)	42	IGEPP
1	1.3.1	**D1.13.** Genes and metabolic pathways involved in resistance to aphids in faba bean, by comparison to pea (PhD manuscript)	72	IGEPP
1	1.3.2	**D1.14.** Root exudate compounds associated with resistance in pea and faba bean	48	IGEPP

WP	Task	Name and nature of delivrables (D)	Date of availability (Months)	Partner in charge
2	2.1	**D2.1**. Scientific article on the effect of different types of diversification at the annual scale	60	UMR Agroécologie
2	2.2	**D2.2.** Effect of new QTL combinations on the resistance of pea cultivars toward *A. euteiches in cropping systems*	60	IGEPP Rennes
2	2.2	**D2.3**. Identification of plant genes that respond specifically to suppressive sols	36	UMR Agroécologie
2	2.2	**D2.4.** Identification of microbial genes or specific organisms that could be responsible of the suppressive effect (direct effect on pathogen or negative effect in the expression of pathogenic potential)	36	UMR Agroécologie
2	2.2	**D2.5.** Model proposition of interaction between Plant-Microbe to explain the suppressive effect in an holobionte perspective	48	UMR Agroécologie
2	2.3.1	**D2.6.** Report of pests, diseases and weeds of legumes crops on CA-SYS, ABY and Biodiversystem platforms of years 1, 2, 3	36	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.1	**D2.7.** Report of pests, diseases and weeds of legumes crops on CA-SYS, ABY and Biodiversystem platforms of years 4, 5, 6	70	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.1	**D2.8.** Scientific article on the dynamics of pests, beneficials and biological regulation of CA-SYS, ABY and Biodiversystem platforms	66	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.2	**D2.9.** Scientific article on the effect of diversified systems x genotype on weeds	66	UMR Agroecologie
2	2.4.1	**D2.10.** Biological control of the pea leaf weevil, *Sitona lineatus* (L.), in pure and mixed leguminous crops	60	IGEPP Angers
2	2.4.2	**D2.11.** Resource exploitation strategy of an aphid parasitoid in diversified cropping systems including leguminous crops. Consequences for biological control	60	IGEPP Angers
2	2.4.2	**D2.12.** Interactions between insect traits and landscape dynamics affect pest density in leguminous crops	60	IGEPP Angers

WP	Task	Name and nature of delivrables (D)	Date of availability (Months)	Partner in charge
2	2.4.3	**D2.13.** Modelling multi-year pests biological control at landscape scale	70	IGEPP Angers
2	2.4.3	**D2.14.** Optimizing pest biological control in leguminous crops with a multiple-scale approach	70	IGEPP Angers
2	2.5	**D2.15.** Synthesis of existing knowledge on different levers at different scales and consequences for the building of decision rules, indicators and advice tables)	12	ESA
2	2.5	**D2.16.** Prototypes of new ways to insert legumes in cropping systems	48	ESA
2	2.5	**D2.17.** Guide for the design of pesticide-free systems rich in legumes (decision rules, indicators and advice tables)	70	ESA
3	3.1.1	**D3.1.** List of assessment criteria and associated indicators to be included in the assessment method to take into account legumes crop introduction in cropping system assessment	12	UE Epoisses
3	3.1.1	**D3.2.** Typology of cropping system based both on legume introduction strategy and pest management strategy and on production situation	30	UE Epoisses
3	3.1.1	**D3.3.** Multicriteria assessment method, adapted to consider risks and opportunity due high frequency use of legume crops.	33	UE Epoisses
3	3.1.1	**D3.4.** Identification of multiperformant cropping systems and of the determinants of their good performances	51	UE Epoisses
3	3.1.1	**D3.5.** A synthesis report on promising pesticide-free legume-rich cropping systems for farmers and advisors	72	UE Epoisses
3	3.1.2	**D3.6.** Literature review on by-production technologies and sustainability of cropping systems	27	IESEG
3	3.1.2	**D3.7.** Scientific paper on modelling by-production technologies to identify eco-efficient cropping systems	36	IESEG
3	3.1.2	**D3.8.** Scientific paper on eco-efficiency analysis of cropping systems with legume crops and no (or less) pesticides.	48	IESEG
3	3.1.2	**D3.9.** Scientific paper on sustainability and resilience of performant cropping systems	63	IESEG
3	3.1.2	**D3.10.** Report on eco-efficient and resilient pesticide-free legume-rich cropping systems	72	IESEG
3	3.2.1	**D3.11.** Report on the evolution of agri-food innovations with grain-legumes and their environmental claims in France compared to other countries in the world over the last decade	15	UMR AGIR

WP	Task	Name and nature of delivrables (D)	Date of availability (Months)	Partner in charge
3	3.2.2	**D3.12.** Report on the ways contractual governance between firms, storage organizations and farmers favour adoption of grain-legumes cropping systems	39	UMR AGIR
3	3.3	**D3.13.** Report on the design and implementation of alternatives to pesticides proposed by scientists: the case of the management of Aphanomyces euteiches risk in pea	12	UMR AGIR
3	3.3	**D3.14.** Report on the systemic Lock-in related to the socio-economic organization of grain-legumes markets	72	UMR AGIR
4	4.1	**D4.1.** Kick-off meeting	1	UMR Agroécologie
4	4.1	**D4.2.** Organisation of EC and Project meetings – Minutes	every year	UMR Agroécologie
4	4.1	**D4.3.** Annual consolidated technical and financial reports	every year	UMR Agroécologie
4	4.1	**D4.4**. Organisation of Stakeholder meetings – Minutes	24 - 72	UMR Agroécologie
4	4.1	**D4.5.** Organisation of mid-term meeting with Advisory board	36	UMR Agroécologie
4	4.1	**D4.6.** Final consolidated technical and financial reports	72	UMR Agroécologie
4	4.2	**D4.7.** Project Website and Collaborative Workspace	3	UMR Agroécologie

Milestones summary

WP	Task	Name and nature of milestones (M)	Date of availability (Months)	Partner in charge
1	1.1.1	**M1.1.** Tool for managing and *in silico* screening genetic resources	36	UMR Agroécologie
1	1.1.2	**M1.2.** Image analysis algorithm set up for pea seed establishment	12	IRHS
1	1.1.2	**M1.3.** Pea collection phenotyped for seedling emergence	24	IRHS
1	1.1.3	**M1.4.** An automated method based on image analysis to count aphids for large-scale plant screening	12	IGEPP
1	1.1.3	**M1.5.** Faba bean collection screened for resistance to *Acyrthosiphon pisum* and *Aphis fabae*	42	IGEPP
1	1.1.4	**M1.6**. Identification of contrasted faba bean for root architecture, nodule number, nodule position and vegetative growth (vigor)	36	UMR Agroécologie
1	1.1.4	**M1.7.** Protocol for studying the response to *S. lineatus* under controlled conditions	48	UMR Agroécologie
1	1.2.1	**M1.8.** Production of pea TILLING mutants in susceptibility genes	24	UMR Agroécologie
1	1.2.1	**M1.9**. Phenotyping of pea mutants and wild-types for disease resistance	30	UMR Agroécologie-Terres Inovia
1	1.2.3	**M1.10.** Crossing design and speed breeding protocol	18	UMR Agroécologie
1	1.3.2	**M1.11.** Protocol for root exudate extraction and test of their effects on spores of *Aphanomyces euteiches*	24	IGEPP
2	2.1	**M2.1.** Choice of species combination based on results on WP1 and other projects	18	UMR Agroécologie
2	2.2	**M2.2**. Development and validation of SNP to evaluate genetic diversity of *A. euteiches* populations	12	IGEPP
2	2.3.1	**M2.3.** Protocol of methodology to assess pests, diseases and weeds of legumes crops on CA-SYS, ABY and Biodiversystem platforms	12	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP

WP	Task	Name and nature of milestones (M)	Date of availability (Months)	Partner in charge
2	2.3.1	**M2.4.** Unique database of data collected on CA-SYS, ABY and Biodiversystem platforms	12	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.1	**M2.5.** Compilation and analysis of results	60	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.1	**M2.6.** Communication, dissemination and transfer of the research results concerning eco-efficient pesticide-free legume-rich cropping systems	66	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.2	**M2.7.** Defining simulation plan with Florsys	24	UMR Agroécologie
2	2.3.2	**M2.8.** Collecting cropping system information on the practices and rotation applied to each systems on the CA-SYS, ABY and Biodiversystem platforms	24	UMR Agroécologie, UE Epoisses, UE Bourges, UE La Motte, UMR IGEPP
2	2.3.2	**M2.9.** Communication, dissemination and transfer of the research results	66	UMR Agroécologie
2	2.4	**M2.10**. Methodology for the assessment of pest control at different scales	12	IGEPP Angers
2	2.5	**M2.11.** Workshop during the kick off meeting on levers available at different scales	12	ESA
2	2.5	**M2.12.** Workshop 1: exchange on results, tools and co-design of innovative prototype of insertions of legumes in pesticide-free systems	24	ESA
2	2.5	**M2.13.** Implementation of prototypes in field experiments	26	UMR Agroécologie

WP	Task	Name and nature of milestones (M)	Date of availability (Months)	Partner in charge
2	2.5	**M2.14.** Workshop 2: exchange on results, tools and co-design of innovative prototype of insertions of legumes in pesticide-free systems	48	ESA
3	3.1.1	**M3.1.** First draft of the multicriteria assessment method	24	UE Epoisses
3	3.1.1	**M3.2.** Methodology to characterise and identify different strategies for introducing legume crops into cropping system management	27	UE Epoisses
3	3.1.1	**M3.3.** Assessment of real cropping systems (cropping systems tested in experimental platform and cropping systems of DEPHY FERME)	39	UE Epoisses
3	3.1.1	**M3.4.** Assessment of co-designed cropping systems	69	UE Epoisses
3	3.1.2	**M3.5.** Identification of activity models to estimate with DEPHY database	18	IESEG
3	3.1.2	**M3.6.** Database construction of virtual cropping systems from agro-model simulations	42	IESEG
3	3.1.2	**M3.7.** Cross efficiency analysis to evaluate resilience and sustainability of cropping systems	54	IESEG
3	3.1.2	**M3.8.** Compilation and analysis of results based on DEPHY observations and simulated data	60	IESEG
3	3.1.2	**M3.9.** Communication, dissemination and transfer of the research results concerning eco-efficient pesticide-free legume-rich cropping systems	66	IESEG
3	3.2.1	**M3.10.** Identification and quantification of the different grain-legumes used on the food markets	6	UMR AGIR
3	3.2.1	**M3.11.** Identification and quantification of the various environmental labels used on markets	9	UMR AGIR
3	3.2.1	**M3.12.** Identification of agri-food firms in France developing an offer with legumes cultivated with agro-environmental labels to question them on the organizational arrangements set up with storage organisations and farmers	18	UMR AGIR
3	3.2.2	**M3.13.** Identification of agri-food firms using crop contracts to secure their supply on legumes and whose are engaged in practices favouring pesticides reduction	24	UMR AGIR
3	3.3	**M3.14.** Draft Report on the Lock In related to the socio-economic organization of pea sector	27	UMR AGIR
3	3.3	**M3.15.** Draft Report on the Lock In related to the socio-economic organization of non-legume sector	48	UMR AGIR

- *Letters of recommendation from the economic sector*

VEGEPOLYS VALLEY
CULTIVONS L'AUDACE VÉGÉTALE

Lettre de soutien

Je soussignée, Séverine DARSONVILLE, Présidente du pôle de compétitivité VEGEPOLYS VALLEY, atteste par la présente le soutien au projet :

« SPECIFICS : Systèmes de culture riche en légumineuses et sans pesticides »

dans le cadre de l'Appel à projet ANR PPR Cultiver et protéger autrement.

En cohérence avec l'objectif général de l'appel, le projet aura pour objectif d'acquérir des connaissances nouvelles sur des systèmes de grandes cultures incluant des légumineuses à graines, afin d'aider à la conception de nouveaux systèmes de culture sans pesticides et intégrant davantage de diversité. Le projet s'intéressera notamment à une diversité déclinée à la fois dans le temps (rotation culturale) et dans l'espace (cultures associées, infrastructures agro-écologiques…), à l'amélioration de la résistance des espèces de légumineuses à différents ravageurs. Le projet prévoit aussi de faciliter l'intégration durable de ces systèmes de production dans les exploitations et les filières pour favoriser leu déploiement. Ce projet rassemble des généticiens, écophysiologistes, pathologistes, entomologistes, microbiologistes des sols, agronomes et économistes.

Ce projet concoure à l'objectif général du pôle de développer une production végétale compétitive et de qualité, respectueuse de l'environnement, de la santé des consommateurs et des producteurs. Soulignons que les légumineuses à graines sont une opportunité pour les transitions écologiques et alimentaires. SPECIFICS se rattache directement aux axes stratégiques 'Santé du Végétal', 'Innovation variétale' et 'Nouvelles technologies et pratiques pour les systèmes de production' du pôle.

Fait à Angers, le 22/11/2019 pour faire valoir ce que de droit.

Séverine DARSONVILLE

Présidente

VEGEPOLYS VALLEY | Association Loi de 1901
Siège social : Maison du végétal | 26 rue Jean Dixméras | 49066 ANGERS CEDEX 01
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PÔLE D'INNOVATION EN AGROÉCOLOGIE

INRA – UMR Agroécologie
17, rue de Sully
21000 DIJON

A l'attention de l'équipe projet SPECIFICS

Objet : Lettre de soutien au projet SPECIFICS porté par l'UMR Agroécologie de Dijon

Madame, Monsieur

L'agriculture doit faire face à un enjeu complexe : produire des matières premières de qualité, pour nourrir la population, avec des ressources naturelles limitées tout en respectant les écosystèmes. Dans ce contexte, AgrOnov donne aux entreprises en lien avec l'agriculture, l'opportunité de développer le réseau dont elles ont besoin pour amplifier leur croissance au service d'une agriculture de progrès conciliant rentabilité et responsabilité. AgrOnov constitue un lieu de convergence qui fait de lui une destination privilégiée pour tout acteur du domaine de l'agriculture. Cette coopération favorise la croissance des start-up, le gain en compétitivité des plus grandes entreprises et permet l'accélération et le transfert de l'innovation.

Cependant, bien que nous travaillions principalement avec des acteurs privés, rien ne serait possible sans les travaux de recherche menés par nos partenaires et les expertises qui en découlent. Aussi, **nous souhaitons apporter par cette présente lettre notre soutien au projet SPECIFICS, porté par l'UMR Agroécologie de Dijon**, et qui vise à acquérir des connaissances nouvelles pour aider à la conception et à la transition vers des systèmes de culture sans pesticides et riches en légumineuses à graines, systèmes particulièrement adaptés aux enjeux actuels. L'ADN de ce projet converge avec les convictions du pôle AgrOnov et nous soutiendrons ce projet de la même manière que nous avions auparavant soutenu le projet I-Site « Agroécologie en BFC » qui s'appuie également sur la plateforme CA-SYS. Soyez convaincus de l'entière confiance que nous portons au consortium de partenaires mobilisés pour mener à bien ce projet et nous nous réjouissons par avance des futurs résultats diffusables qui résulteront de ce travail de longue haleine.

Je vous prie d'agréer, Madame, Monsieur, l'assurance de mon profond respect.

Frédéric IMBERT
Directeur d'AgrOnov

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Nos réf : VIT 098-19/EDS
Objet : Lettre de soutien du projet SPECIFICS : Sustainable PEst Control In Fabaceae-rich Innovative Cropping Systems

Dijon, le 26 Novembre 2019

Madame, Monsieur,

Le pôle Vitagora a été sollicité par Judith Burstin, Directrice de recherche à l'UMR Agréocologie, pour soutenir le projet SPECIFICS déposé à l'appel à projets du Programme Prioritaire de Recherche « Cultiver et Protéger autrement », lancé par l'Agence Nationale de la Recherche.

L'examen du dossier a fait ressortir les éléments suivants :

- L'objectif du projet est de concevoir des systèmes de production permettant l'insertion de légumineuses à graines et tendant vers une gestion sans pesticides. Pour cela, les leviers étudiés seront par exemple les complémentarités des espèces cultivées, la résistance génétique ou le contrôle biologique. SPECIFICS vise plus spécifiquement à étudier le potentiel des champignons entomopathogènes pour améliorer la productivité des cultures de légumineuses et pour lutter contre les nuisibles.

- Les essais menés dans ce projet s'appuieront, entre autres, sur la plateforme agroécologique de Bourgogne-Franche-Comté CA-SYS.

- Ce projet est constitué d'un partenariat pluridisciplinaire (agronomes, généticiens, entomologistes, écologistes, socio-économistes) rassemblant 9 organismes de recherche, dont l'UMR Agroécologie de l'INRA Dijon et l'Unité de Recherche Génomique Info de l'INRA Versailles.

Le projet SPECIFICS s'inscrit bien dans la stratégie du pôle Vitagora « l'alimentation durable au service du bien-être des consommateurs » en développant des pratiques agroécologiques et en favorisant l'insertion des légumineuses à graines dans les systèmes de production.
C'est pourquoi nous souhaitons le soutenir dans le cadre de l'Appel à Projets « Cultiver et Protéger autrement » de l'ANR.

En vous remerciant de l'attention que vous porterez à cette demande, nous vous prions de croire, Madame, Monsieur, en l'assurance de notre profonde considération.

Christophe BREUILLET
Directeur de VITAGORA

Vegenov BBV

Madame Judith Burstin
UMR Agroécologie
INRA Sully
17 rue Sully
BP 86510
21065 DIJON

Saint-Pol-de-Léon,
le 29 novembre 2019

Madame Burstin,

Nous souhaitons par ce courrier soutenir le projet « SPECIFICS », présenté par l'UMR Agroécologie de l'INRA (Dijon) et ses partenaires (UMR IGEPP, LEVA ESA Angers, UMR AGIR, IESEG Lille, UMR IRHS, URGI, UE Epoisses, UE Bourges, UE La Motte, UMR CESAER, UMR AFP) à l'appel à projet ANR PPR « Cultiver et protéger Autrement ».

En effet, votre projet « SPECIFICS » a pour objectif d'identifier et d'évaluer de nouveaux leviers pour contribuer à la reconception des systèmes de cultures traditionnels en contribuant à réduire l'usage des produits phytosanitaires et augmenter la culture d'espèces de légumineuses à graines. Les légumineuses à graines présentent l'avantage de réduire l'utilisation des intrants azotés dans les agrosystèmes et de s'insérer dans des schémas de transition alimentaires basés sur une réduction des protéines d'origine animale.

Vegenov est un centre de ressources technologiques (CRT) spécialiste du végétal, focalisé notamment sur l'amélioration des plantes et le développement de méthodes alternatives de protection des plantes. Nous sommes donc sensibles à l'approche proposée dans votre projet et les retombées attendues du projet « SPECIFICS » permettront de contribuer à une agriculture plus durable.

Les objectifs fixés dans votre projet « SPECIFICS » nous semblent en totale adéquation avec les objectifs de rupture des systèmes d'agriculture traditionnels visés dans le Programme Prioritaire de Recherche « Cultiver et protéger Autrement ».

Il nous paraît donc important de soutenir votre projet et que votre unité et vos partenaires puissiez bénéficier des financements nécessaires à la réalisation de ce projet.

Veuillez agréer, Madame, l'expression de nos sentiments distingués.

Le directeur,
Serge Mabeau

Terres Inovia
l'agronomie en mouvement

UMR AGROECOLOGIE
Mrs BURSTIN Judith
Mr CORDEAU Stéphane
INRA, Centre de Dijon
17 rue Sully, BP 86510
21065 DIJON Cédex INRA

Paris, November 28th 2019

Support Letter

Dear Dr Burstin, dear Dr Cordeau,

Following your request, I am happy to offer the endorsement of Terres Inovia to your project entitled SPECIFICS (Sustainable PEst Control In Fabaceae-rich Innovative Cropping Systems). This project suits perfectly with the objectives of my institute, and the French oil and protein crop farming industry that we support, to reduce the use of phytosanitary products and to provide alternative solutions for crop protection, which we view as a great challenge for tomorrow's agriculture.

Terres Inovia's mission is to improve the economic competitiveness of oilseeds, grain legumes and hemp crops via applied research results, by adapting production to the broad economic context, regulatory requirements and societal demands. Our institute is administered and financed by farmers themselves, as well as the upstream and downstream industries they relate to and have invested in: as such, our endorsement can be viewed as support from the whole of the oil and protein crop sector in France.

The SPECIFICS project will contribute to unlock the potential of INRA's knowledge and knowhow in genetics, agronomy and economy to assist in the design of new solutions for crop protection relevant to pea, lentil and faba bean crops. The integration of legumes in current French cropping systems is consensually viewed as a means to increase overall durability of French (and European) farming. The simulations carried out in preparation of the future French protein plan indicate that the 3 crops targeted by SPECIFICS are all targeted to increase. However, efficient crop protection for these species is increasingly limited, and seen as the major barrier to their increased adoption. We strongly believe this limiting factor must be lifted, and that SPECIFICS can provide a significant contribution in this direction.

Please, do not hesitate to use this letter to attract support for your SPECIFICS project.

Yours faithfully,

The Deputy Director

David GOUACHE

ROQUETTE
Offering the best of nature™

Marie-Laure EMPINET
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France

Judith BURSTIN
UMR AGROECOLOGIE
INRA Dijon
17 rue Sully
21065 DIJON CEDEX – France

La Madeleine, le 2 décembre 2019

Objet: Lettre de soutien du projet SPECIFICS déposé à l'ANR Protéger et Cultiver autrement

Par cette lettre, ROQUETTE atteste son soutien au projet SPECIFICS, coordonné par l'UMR Agroécologie, et déposé à l'appel à projets de l'Agence Nationale de la Recherche 'Cultiver et protéger autrement'.

ROQUETTE est impliqué en France dans la filière Pois Protéagineux pour son usine de Vic-sur-Aisne. A ce titre, la conception de système de culture riches en légumineuses et sans pesticides nous intéresse beaucoup car cela conforte la production en France et pourrait répondre aux attentes des consommateurs.

Si ce projet est financé, ROQUETTE s'engage à participer aux deux réunions de restitution programmées et à fournir des conseils et recommandations afin de favoriser les retombées du projet pour la filière agricole. M. Gwénolé PASCO sera le correspondant ROQUETTE : il participera à ces deux réunions ou se fera représenter si les dates choisies ne pouvaient convenir. Vous pouvez le contacter par mail à l'adresse suivante : gwenole.pasco@roquette.com.

Je vous prie d'agréer, Madame, Monsieur, l'expression de mes salutations distinguées

Christophe RUPP-DAHLEM
Head of Global Public Affairs
(For Pierangelo MARCONI,
Global Category Manager – Special Raw Material Purchasing)

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Judith Burstin
UMR AGROECOLOGIE
INRA Dijon
17 rue Sully
21065 DIJON CEDEX - France

Objet: Lettre de soutien du projet SPECIFICS déposé à l'ANR Protéger et Cultiver autrement

Par cette lettre, Dijon Céréales atteste son soutien au projet SPECIFICS, coordonné par l'UMR Agroécologie, et déposé à l'appel à projets de l'Agence Nationale de la Recherche 'Cultiver et protéger autrement'.

En effet, le groupe Dijon Céréales est fortement impliqué dans le développement des systèmes de cultures incluant des légumineuses, et limitant l'utilisation de pesticides. De plus, le groupe collabore, depuis plusieurs années avec l'INRA, et particulièrement l'UMR Agroécologie, sur différents projets autour de cette thématique.

Si ce projet est financé, Dijon Céréales s'engage à participer aux deux réunions de restitution programmées et à fournir des conseils et recommandations afin de favoriser les retombées du projet pour la filière agricole.

Christophe RICHARDOT
Directeur Général
02/12/2019

Société Coopérative Agricole N° agrément : 2196640 - RCS DIJON D 378 610 703 - SIRET 378 610 703 00480 - APE 4621 Z