28 January 2019

CORE Organic Plus, contract No. 618107

Periodic report 3: 1 April 2017 to 30 November 2018

Project objectives for the period

The overall objective of the CO Plus is to efficiently support transnational research addressing major potentials and challenges for the development of organic food and farming and the industry's capacity to contribute to solving important societal challenges.

In the period relevant for this report, the project objectives were:

WP1

- To ensure a smooth and timely running of all activities within the ERA-NET Plus,
- To facilitate proper and transparent decision-making,
- To manage the funds received from the EC,
- To perform the general communication with the EC, stakeholders and other countries,

WP4

- Monitoring trans-national projects avoiding overlaps and improving (supporting) cooperation within the research society,
- Providing progress reports as input to periodic and final report to the Commission,
- To do efficient project evaluation of high quality,

WP5

- To publish information on CO and the funded projects via different dissemination tools such as websites, newsletters etc.,
- To improve and disseminate project/research results nationally and internationally to stakeholders and end users (e.g. via research seminars),
- To improve Organic Eprints functionality and capacity for both projects and reports,
- To assess the impact of CO Plus funded projects.

Work progress and achievements during the period

WP1: Management of consortium

Objectives of the period:

- To ensure a smooth and timely running of all activities within the ERA-NET Plus
- To facilitate proper and transparent decision-making
- To support the effective management of the transnational call
- To manage the funds received from the EC
- To perform the general communication with the EC, stakeholders and other countries

Task 1.1. ERA-NET Plus management (task leader ICROFS)

The task ensured coordination, management and administration of the ERA-Net. The task is described under the project management section at the end of this document.

Task 1.2. Fund and budget management

Progress and results

The initial phase of fund management has been challenging as only 23% of the EU funds were pre-paid after the first reporting period instead of the usual 80%. Out of the total funding of 11.3 million EUR for the 11 CO Plus projects awarded by the CORE Organic Plus funding bodies, 2 million EUR were coming from cofunding from the EU. The consequences were that funding bodies in CO Plus had to pre-pay the eventual EU part of their national projects with national funding. In order to ensure that the researchers would be paid on time in accordance with their national contracts, the coordinator had explored a possibility for each funding body to pre-pay the EU part and made the payment schedule accordingly. The majority of funding bodies accepted to wait with their EU payments and in this manner the coordinator was able to support the five funding bodies having difficulties in pre-financing the EU part.

The challenges with the payment schedule were resolved after the third EC payment where the full amount of approximately 1.5 million EUR was granted to the CO Plus. In order to distribute funds among the partners for the transnational research projects a percentage of what partners have already paid to researchers was calculated, and then the same percentage was applied to the amount they needed to receive from the EC funds. The project manager has also developed a closer collaboration with the AU finance department in relation to the fund and budget management by establishing weekly coordination meetings. The practice is to ensure a comprehensive budget management on behalf of the EC and CO Plus funding partners while also providing continuous support in relation to the funds administration. The collaboration with the AU finance department is continuing in the CO Cofund in order to ensure an adequate handover process and continuity in the finance administration.

The budget overview for the CO Plus partners and final overview is available in the closed section for partners at: http://projects.au.dk/coreorganiccofund/, “login Governing Board” on the left side, user name: “gbdoc2017” and password: “coreorggb2017”. The budget is available under “Documents from Board meetings”. The overview of funds spent is available at the same place and the name of the document is “CO Plus budget vs costs 28JAN19”. The budget has leftover of 25.417 EUR from 992.347 EUR. There are still

remaining expenses that partners will have in relation to the final financial reporting (i.e. Mipaaft needs to have an audit certificate).

Deviations and impact on other tasks:

Amendments to the budget:
The CO Plus budget (located in the section for partners) had two main revisions during summer 2018 that were agreed between the secretariat and consortium partners:

- Under the budget lines '*All partners PM', 'Partners work in WP 1, 2, and 3' and 'Evaluation funding bodies PM*' there was a total amount of 85.580 EUR that was not distributed. The funds were combined and redistributed among all CO partners as 0.5 PM compensation for their work in CO Plus and initial phase of the CO Cofund ensuring continuity the two project periods.
- Under the budget lines 'Travels', 'Organize meetings PM', 'Organize meeting catering', and 'Seminars' there was a total amount of 60.270 EUR that was not distributed. The funds were combined to cover the expenses of the CO Plus Final Research seminar 9 October 2018 (Paris, FR) organized in junction with the CO Cofund Governing and Call Board Meetings. Besides direct costs of the Paris meetings, the consortium established proportional travel budgets for the CO partners covering both programme periods. The introduction of travel budgets has reduced an administrative workload related to the travel reimbursements and ensured partners participation in CO networks events.

Task 1.3. Contact with external parties: other ERA-NETs, EC, transnational stakeholders, potential future partners (task leader ICROFS)

Progress and results

Other ERA-Nets:
ERA-NET SUSFOOD2 (Sustainable Food Production and Consumption)
Following the collaboration that already started from 2015 in CO Plus and in order to explore possibilities for collaboration and a joint call, SUSFOOD2 project manager participated in CO Governing Board Meeting 24-25 October 2017, (Namur, BE), and CO participated in the ERA-NET SUSFOOD2 Cofund Governing Board Meeting on 13 December 2017 (Madrid, ES).
Following these meetings, SUSFOOD2 project manager was invited to participate as a speaker at CORE Organic Biofach Congress event 'European research meets organic food processing at eye level' held on 15 February 2018 at Biofach World Organic Trade Fair (Nuremberg, DE). As results, there was an intense exchange among the secretariats of both ERA-NETs and initial commitment towards possibility of a Joint call in 2019. The two networks have organized 'Joint SUSFOOD2 – CORE Organic exploratory workshop' on 6-7 June 2018 (Brussels, BE). While both networks have their own, clear scope and target different audiences, there are also common themes of interest, where meaningful intersections can be envisioned without unnecessary duplication. Both the SUSFOOD2 and the CORE Organic ERA-NETs have expressed an interest to develop joint activities together on themes of mutual interest and expressed commitment in terms of joint content (possible topics for cooperation) and form (joint call, other joint activities). The process was more formalized during autumn 2018 and is taken further in the CO Cofund programme period.

PLATFORM of Bioeconomy ERA-NET Actions:
ICROFS was an active partner in the PLATFORM2 project and was representing CORE Organic Plus/ Cofund at PLATFORM meetings. The project that ended in early 2018.

In the project period, the programme secretariat has taken part in the organization of Master Class held back-to-back with Workshop on 7-9 June 2017 in Copenhagen, DK:

- Master Class on ERA-NET Cofund Actions 2017 - tools and methods for efficient call management, and
- Workshop on Monitoring, Evaluation and Impact Assessment of P2P Networks and Projects 2017,

As noted in the previous periodic reports, CORE Organic was very successful in ensuring the involvement of all funding bodies in the selected projects and developing best management practices. In particular, the project monitoring method from the CO Plus (involving four members monitoring team) was shared at the last Platform Master Class in 2017 as an inspiration for other ERA-Nets. For further information, please consult the Report.

The European Commission:
The project secretariat participated in the EC events and presented CORE Organic Plus/Cofund:

EC AgriResarch Conference 'Innovating for the future of farming and rural communities, held on 2-3 May 2018 n Brussels, BE. The ERA NET CORE Organic had presentation in the '*Parallel session 2: Healthy plants, animals and ecosystems for healthy people. How to maximise synergies between various instruments and approaches?'*

Transnational stakeholders:
IFOAM/ TP Organics is a stakeholder partners and observer at GB meetings providing an opportunity to share their perspectives and latest policy related news.
During Science Day at Biofach 2018 (16 Feb 2018), IFOAM/ TP Organics as a host co-organized with ERA-NET CORE Organic Programme the session dedicated to EU research and innovation policy discussing relevance of research in the organic sector and its contribution to more sustainable food systems. The CO Plus projects from call topic 'organic food processing' were presented by their industry partners (EcoBerries, FaVOR-DeNonDe and SusOrganic projects).

Potential future partners:
The inclusion of one or more international countries in CORE Organic was discussed at the GB meeting already in October 2015. Starting point were partners from Egypt and Tunisia that were ready to join future EU funded call, and Brazil, Canada and US were identified in the CO II as the highest priorities for global collaboration. It was considered that Brazil was very relevant in terms of topics of interest, and Canada and the US in terms of methods applied. The process was taken further in the overlapping phase of CO Plus and Cofund, following the GB meeting in October 2018 when partners further emphasized importance of international cooperation with: Mediterranean countries, Brazil and Canada. At the Biofach 2018 (15-16 Feb 2018), CO delegation met with international partners from Brazil and Canada to seek further collaboration possibilities. The activities are planned under Cofund WP7 'Other joint additional activities' and first event is 'Outreach seminar for international collaboration' scheduled in January 2019 with a specific focus on funding bodies from Brazil, Canada and Mediterranean countries. At the seminar CO will present its objectives, working methods and an overview of the joint call 2019, while international partners will present current status of national research in

their respective countries. The presentations will be the base to discuss the potential collaborations and possibilities for participation in the joint call.

Deviations and impact on other tasks:
None

WP2: Thematic Research Areas and Call Text

Objectives of the period
None

WP3: Launching of a Plus call and selection of projects

Objectives for the period:
None

WP4 Project monitoring

Objectives of the period:

- Monitoring trans-national projects avoiding overlaps and improving (supporting) cooperation within the research society,
- Providing progress reports as input to periodic and final report to the European Commission,
- To do efficient project evaluation of high quality.

Task 4.1 Continuous monitoring of the progress within the research projects (task leader ICROFS)

Progress and results

The aim of the monitoring team is to increase impact of the funded projects by a close monitoring of selected research projects. The activities include: 1) acting as liaison person between funding institutions and project coordinator during the project contracting phase, implementation and reporting, 2) ensuring discussions and eventual implementation of the recommendations from the expert evaluation, 3) ensuring that the projects fulfil objectives outlined in the project proposal, 4) identify challenges in an early stage of project implementation, 5) assisting the projects in keeping the focus on the needs of the sector, 6) facilitating dissemination activities throughout the project, 7) bridging the projects within the same thematic research area, and 8) organization of the monitoring meetings (i.e. preparing schedule, chairing of the meeting, etc.).The team of four persons divides the responsibilities in accordance with the four thematic areas from the call and it consists of: Marian Blom (Bionext, NL): plant/soil interaction; Lieve de Cock (ILVO, BE): functional biodiversity; Arnd Bassler (BLE, DE): livestock production and Ivana Trkulja (ICROFS, DK): organic food processing. After mid-term project reporting (November 2017) Arnd Bassler retired from his position and monitoring task for the livestock production research project has taken over by the members of monitoring team: Lieve De Cock (PrOPara), Marian Blom (2-ORG-COWS) and Ivana Trkulja (ORGANICDAIRYHEALTH).

The monitoring team members became part of the joint CO Plus and Cofund Management Board in order to inform the MB about the research projects implementation and contribute to the overall decision-

making on the consortium level. The funding bodies discuss relevant monitoring issues at GB meetings, and are contacted directly by monitoring persons in case action or advices are needed in relation to the project.

The monitoring team also participated in some projects' meetings and their tasks were: 1) to evaluate how well the projects progressed, 2) to evaluate if any results would be interesting for WP5 to disseminate; 3) to explore if support was needed from the team or from national funding bodies, and 4) to remind project coordinators of their obligations towards CO stipulated in the 'Annex to the National Contract'. In the future the funding body of the country in which the project meeting is held will be invited to attend.

During the present reporting period, CO Plus mid-term project reporting phase was just finalized and mainly the CO Plus final reporting has taken place). The final submitted reports were discussed, evaluated and adopted at monitoring meetings organized by the monitoring group in collaboration with the funding institutions. The project monitoring was organized as interactive web-meetings (via Adobe connect) or following new approach as face-to-face meetings at the CO Final Research Seminar (October 2018, Paris, FR). Particpants to the meetings were: the funded project coordinator, the monitoring person, the funding bodies. The consortium partners and project coordinators have expressed their satisfaction with the new face-to-face format used for monitoring and evaluation of the projects.

Deviations and impact on other tasks:

The monitoring person Arnd Bassler (BLE) resigned from position and other monitoring team members completed the task. The monitoring persons had regular contact by e-mail, web conferences or telephone to discuss the monitoring tasks and the criteria used to monitor the projects and how to solve problems. This resulted in an aligned approach of monitoring in the 11 funded projects. It has not resulted in a standardised set of monitoring criteria, but based on this experiences such plan can be drawn up and used as basis for a next call.

Task 4.2 Evaluation of the results of the research projects at mid-term and at the end (task leader ICROFS)

Progress and results

The mid-term CO Plus project evaluations took place in spring and autumn 2018. During the preparation of the schedule for final monitoring meetings, the monitoring team realized that many of the meetings were planned during the summer months and that could influence participation of the funding partners that are involved in the evaluations. Consequentially, the team decided to divide projects in two groups where the first group had the web meetings (via Adobe connect) and the second group of projects was monitored as a face-to-face meetings at the Final Research Seminar on 9 October 2018, Paris, FR (Table. 1).

The monitoring persons received all the final reports from the project coordinators in their thematic research area, checked the reports for completeness and availability of relevant deliverables and publications, and submitted the report to the funding bodies for evaluation with indication when the web or face-to-face evaluation meeting would take place. The funding bodies had one month for reading the

report and preparation for the meeting. The monitoring person together with a funding body representative (from the country of coordinator) chaired the meeting and drafted the minutes. The CO secretariat and funding bodies sent questions and comments in advance to the project coordinator or reacted spontaneously during the meeting. During the evaluation meeting the project coordinator presented the report and answered the questions raised by funding bodies. The final objective was that funding bodies decided if the report could be approved or revisions should be requested. For detailed distribution of tasks during the evaluation of the project reports please see Table 2. The innovation in monitoring process during CO Plus was related to inclusion of 'face-to-face' meetings as a part of the Final Research Seminar. In order to introduce this change the Seminar was given a broader scope and called 'CORE Organic Plus/Cofund 'Research Impact & Dissemination Workshop' integrating discussions on impact and dissemination of research results in order to provide the link between CO Plus and Cofund programme periods. There were parallel monitoring sessions organized for six projects that had presentations at the 'Workshop'.

Table 1. The plan for final evaluation of the Plus projects.

CORE Organic Plus/ Monitoring and evaluation plan 2017-2018

No.	Project name	dec-17	jan-18	feb-18	mar-18	apr-18	maj-18	jun-18	jul-18	aug-18	sep-18	okt-18	nov-18	dec-18
1	FertilCrop	31.12			31.03		EM 7/05							
2	ReSolVe							30.06	31.08			EM²		
3	SoilVeg						31.05			1.08		EM²		
4	PRODIVA						31.05	24.08				EM²		
5	ECOORCHARD						1.06	24.08				EM²		
6	PrOPara									31.08	22.10		EM	
7	2-ORG-COWS						31.05	31.07				EM²		
8	ODH				15.03			14.06			EM 3/09			
9	EcoBerries				15.03			15.06			EM 5/09			
10	SusOrganic			28.02				15.06			EM 10/09			
11	FaVOR-DeNonDe					31.03			30.06		EM 12/09			

•Monitoring and evaluation plan table explaination:

reporting period — Monitoring and evaluation process

End date — Report submission date — EM= evaluation meeting (EM² (Face-to face) 9 October 2018, Paris, FR)

Table 2. Distribution of tasks during the evaluation of the project reports.

N°	Task	Monitoring person	Chair of the evaluation	Funding body
1	Collect the final report	X		
2	Check completeness of report (i.e. uploads in Organic Eprint and access to public/private deliverables).	X		
3	Send the report to the funding bodies of the project	X		
4	Organize the evaluation meetings via web conference earliest 1 month after the funding bodies have received the report (monitoring person and funding body from the coordinator's country). Collaborate with project coordinator to fix date and time with availability of minimum the chairs, coordinator and technical person (ICROFS), funding bodies can send replacements. Coordinator can invite WP leaders.	X	X	
5	Read and evaluate the report and send comments, questions and eventual requirements latest one week prior to the web conference to the research coordinator with copy to all funding bodies or prepare questions to ask during the session.			x
6	Chair the evaluation meetings, take notes, make sure any requirement for minor or major changes are agreed to during the meeting		x	
7	Take active part in the evaluation meetings.			x
8	Write the minutes of the evaluation meeting including any possible minor or major requirements for the project.	X	x	
9	Distribute the draft minutes to the monitoring board.		x	
10	Approve the minutes of the evaluation meeting (=approval of report if no amendments are required).			x
11	Inform the project coordinator and CO secretariat about approval of the report if no amendments are required. If minor changes were required: Receive the corrected report from project coordinator and approve on behalf of the funding bodies. If major changes were required: send to funding bodies for final approval. Inform the project coordinator and CO secretariat about approval of the report.		x	
12	If major changes were required: read, evaluate and approve the corrected report.			x
13	If major changes were required: inform the project coordinator and CO coordinator about approval of the report.		x	

Progress report from the projects in connection to final reporting (web meetings 7 May 2018, 3-5-10-12 September 2018 and face-to-face meetings during the Research Seminar 9 October 2018).

2-ORG-COWS Project

The project results (studies on genetic parameters, GxE interaction, line comparisons) have already been presented on national (DGfZ/GfT-meeting in Hannover, Journées Rencontres Recherches autour des Ruminants) and international conferences (EAAP, ICAR, Brown Swiss World Congress) in 2016. During the EAAP conference in 2016, results were presented within an own Core Organic session titled 'Adaptation of dairy and dual purpose cattle to harsh environments', including presentations from the collaborative projects 2-Org-Cows and ORGANIC DAIRY HEALTH. As a major result from the first project year, genotype by environment (GxE) interactions considering novel environmental classifications were only identified for functional traits e.g., fat-to- protein ratio and somatic cell count. At the end of the project, the partners indivated in their final report that they 'have generated a large SensOor®-database across country borders and breeds, even allowing multi-breed genome wide association studies for longitudinal behaviour traits (see WP 5) and identified highly significant genetic markers, and associated physiological and biological pathways, as well as a potential candidate gene for SensOor®-traits (cow activity, rumination).' The final project monitoring meeting was held on 9 October 2018 (Paris, FR) where an overall implementation was evaluated as positive. The final project report was approved and no specific amendments were requested.

ORGANICDAIRYHEALTH project

Organic cattle milk production is the largest and by far the economically most important organic livestock production in Europe. OrganicDairyHealth focuses on dairy cow health through a combined improvement of management and breeding, providing a unique opportunity for improving societal trust in organic milk by maintenance of good welfare including health in systems with relatively low concentrate and medication use and high levels of grazing. The overall aim of the project is to improve udder and metabolic health in organic cattle milk production through breeding and management. Preliminary results show that lifetime production was higher in all commercial breeds, but productive lifespan was higher in the local breed than in the commercial breed in Austria. In Switzerland there was no significant difference between breeds, and in Poland one of the three local breeds (Polish Black and White) had a higher productive lifespan than the commercial breed. In the final report partners have reported overall satisfaction with planned activities where research 'results obtained provided new and relevant knowledge on how to improve health in organic dairy cattle farms through breeding and management. Only minor changes were made. The experimental design in WP5 was reduced from three to two treatments. This was done to simplify the in herd design and in order to obtain enough cows per treatment. The idea to obtain information on individual cow activities on pasture for analysing the relations ship at cow level between cow activity and metabolic diseases planned in WP6 was not conducted. The main reason was that it was not possible to obtain information from the companies providing activity measure equipment in the Danish dairy herds.' The final project monitoring meetings were held on 3 September 2018, and due to requested additional inputs, again on 9 October 2018 (Paris, FR) where an overall implementation was evaluated as positive. The final project report was then approved and no specific amendments were further requested.

PrOPara project

The project focuses on Liver fluke (*Fasciola*) prevalence on organic dairy, goat and sheep farms in EU and risk factor analysis takes place in the Netherlands, Denmark, Germany, and Lithuania. An additional

objective was to validate the bulk milk samples antibodies as a diagnostic tool for the disease; it was reported that the outcomes of blood antibodies were not always in line with milk antibodies, questioning the validity of milk antibodies for *Fasciola* diagnosis. Similar risk factor for infection with liver fluke in the various EU countries were revealed including grazing on wet areas or having access to surface water, co-grazing of animals in different production groups. The significant higher prevalence of liver fluke compared to conventional ones indicating that the extended grazing periods in organic herds me be associated with higher prevalence. The loss of animal weight showed not to be a good proxy for level of parasitism in cattle. Alternative strategies offered to farmers to control gastrointestinal nematodes in sheep, goat and cattle herds, such as changes in pasture system and the use of bioactive plants needs to be farm specific, to suit individual characteristic of both the farm but also the beliefs of the farmer.

In general, the project has achieved most of its objectives.

A no-cost extension of the project was exceptionally allowed until 31 August 2018. The coordinator delivered the final report of the project in time and included the promised deliverables (except one). One deliverable, the development of a mathematical model, was not possible to deliver due to the inappropriateness of one of the parameters foreseen to be used in the model.

The coordinator presented the project results in a plenary session during the CO Research Seminar in Paris on 9 October. The FB's had the possibilities to ask questions during the seminar and by email afterwards. Due to the late extended project date, the CO secretariat and FB's agreed to finalize the final evaluation process by email. All FB's approved the final report by 30 November 2018.

FertilCrop project

Research in FertilCrop made use of existing field trials on reduced tillage and green manure as well as on the comparison of organic and conventional farming systems along a SW to NE gradient across Europe to look at fertility building measures and tools to allow for their evaluation. The project comprised three experimental work packages on weeds, soils and microbes, and three WPs evaluating and using existing knowledge. The project had a late start, since the partners had to develop a common methodology before research activities could start. But as a good working relations were developed quickly there were few delays in the milestones and deliverables at mid term and the project was able to already deliver some technical leaflets on measuring soil fertility, eg. the teabag method for measuring decomposition rate. In the final report partners have reported rich dissemination results among which five technical notes were released about practical field tests for farmers. They are about weeds as bioindicators, spade test, earthworms, teabag assay and root nodules. The technical notes and videos on the spade test are accessible via the FertilCrop webpage.

The final project web monitoring meeting was held on 7 May 2018 where an overall implementation was evaluated as positive. The final project report had initially conditional approval and following submission of additional information it was fully approved and no specific amendments were further requested.

ReSolVe project

The project, with as main objective to test if degraded soils in organic vineyards can be restored quickly by application of composts and green manures, achieved all the expected objectives for the first half of its activities. Only a few technical problems occurred, due to the weather conditions that hindered the seeding. But they have been partly overcome by re-seeding the plots with a scarce grass cover. Still due to this difficulty that occurred in Autumn-Winter 2015 in France, Slovenia, and Spain, the project coordinator asked for an extension until the end of June 2018 to allow for more monitoring and data gathering. This was granted

by the funding bodies. The project was tested in 19 different locations. The final project monitoring meeting was held on 9 October 2018 (Paris, FR) where an overall implementation was evaluated as positive. The final project report was approved and no specific amendments were requested.

SoilVeg project

Soilveg's aim is to introduce the no-till roller crimper technology in organic vegetable cropping systems and to test if green manures in the south in the summer would have added value. The project had a quick start and at the kick-off the critical remarks from the expert evaluation on measurement of GHG emissions were taken into account and the project was adapted accordingly. No further mendments were reported. Fieldvisits prove to be a very effective way of information exchange with the target groups on the roller crimper technique. The project partners reported that they have 'reached some crucial points: namely, no-till ASC operations generally require less energy than conventional management through green manure which requires additional chopping and plowing in the soil. If properly set, ASC mulching induced energy saving to weeds control and for irrigation. Furthermore, it is interesting to note that weed communities changed in function of ASC and termination strategies and that roller crimper treatments reduced weed species richness but also contributed to weed control thanks to weed density reduction. Thus, SoilVeg trials open up the hypothesis of stressing weed contribution to agroecosystem functioning without the need of controlling them. Moreover, the introduction of ASC with no-tillage seems a good strategy to maintain higher system biodiversity. Roller crimper proved not to be harmful to arthropod populations and proved to promote the conservation of important soil predators. Actually, the use of roller crimper enhanced the presence of important groups of predator arthropods. On the basis of the results obtained within the SoilVeg Project scientists have identified the next research needs to further implement and to enhance the impact of the no-till techniques in the organic vegetable systems and these research needs are all focused on how mitigate yield reduction that have been observed implementing no-till systems in vegetable cropping systems.' The final project monitoring meeting was held on 9 October 2018 (Paris, FR) where an overall implementation was evaluated as positive. The final project report was approved and no specific amendments were requested.

EcoOrchard project

The ECOOrchard project aimed to contribute to the development of knowledge and scientific evidence of the value of Functional AgroBiodiversity (FAB) in apple orchards. The project was highly valued by the involved funding bodies. The positive results of the ECOOrchard project are very hopeful and are seen as very promising for further support for this research area and topic. Flower strips significantly increased plant diversity in orchards, and increased the presence of natural enemies in the apple trees. This led to a higher control of key apple pests and a reduction in fruit damage. Although pest suppression and damage reduction may not be enough to use this conservation biological control strategy as a stand-alone practise, flower strips can contribute to a build-up of the resilience of the apple agroecosystem against pests, reducing the need for insecticide use and favouring conservation biocontrol. A no-cost extension of the project until 31 May 2018 was allowed by CORE Organic secretariat and the involved Funding Bodies (FB) due to a delay in the start of some partners for administrative reasons. Notwithstanding the delay in the start, the project progressed further according to plan and succeeded in achieving its objectives. The final report was delivered in time and approved by all FB's. The final evaluation meeting took place at the CO

Research Seminar in Paris on 9 October as a face to face meeting. Beside the outreach publications (for some WP's, the manuscripts are still in progress) all the deliverables are reached.
The effort of the consortium to interact with the stakeholders and communicate the findings of the project were highly appreciated. Knowledge and experience on FAB management both from practitioners as well as scientists has been collected by different activities. Additional efforts were made to write technical leaflets/booklets for advisors and farmers on FAB assessment and on FAB management in orchards in several languages.
The development of a board game 'design the orchard of the future', co-funded by the project, is a nice example of a tool that facilitates discussions on design of an ecological orchard with different stakeholders in a pleasant and interactive way. The EBIO-platform (https://ebionetwork.julius-kuehn.de) constructed during the project period will continue to facilitate exchange of information and dissemination of project outcomes and will continue to collect information about creation and assessment of FAB in orchards. The website will be further maintained by Julius Kühn institute in Darmstadt (Germany).

PRODIVA project

PRODIVA aimed to produce information required for a better utilization of crop diversification for weed management in North European organic arable cropping systems. The PRODIVA project was highly appreciated by the involved funding bodies (FB). They highly valued the results that the project achieved taken into account the restricted budget of the project. The very detailed research questions formulated in the project, made it very challenging to find significant results in the short project period. Overall the project ran as planned but results were not always as expected. The objective of identifying traits of importance in crop species mixtures for weed suppression to a greater extent than the sole crop species has not been fully achieved. Varieties among spring barley and peas that differ with regard to the ranges and peaks of their leaf area duration curves may provide better results. The identification of variety blends that can suppress weed growth to a greater extent than the sole varieties was also not fully successful. Varieties of spring barley and oat with more extreme traits, for example longer stems and faster initial growth rates, are likely to results in more weed suppression from variety mixtures. But crop rotations were cover crops/green manure crops are included in the crop sequence proved to be better in suppression of perennial weed species. Especially clover species as alsike clover, red clover and white clover are suitable cover crops for weed suppression under Northern conditions Success stories of farms using crop diversification revealed crop sequence measures as the most important tool for weed management at the moment.
A no-cost extension of the project was allowed until 31 May 2018 mainly due to the late start of one of the partners. The partner had a core role in consolidating the results of all project partners.
The final report of the project was delivered in time by the coordinator and included all the promised deliverables. All the FB's approved the final report. The final evaluation meeting took place at the CO Research Seminar in Paris on 9 October as a face to face meeting.

EcoBerries project

The main goal of the project has been to develop innovative sustainable processing and packaging technologies to meet the growing consumer demand and boost the manufacturing of safe organic berry products with high nutritional quality and low environmental impact. The aim has been to evaluate technologies to naturally extend the shelf-life of fresh organic berries and to process berries into a wide variety of value added products. Several solutions and technologies for extending shelf life and the overall

quality of fresh and processed berry and fruit products have been identified and developed during the three years of the project. The major results and achievements are described in the final report:

- A virtual Modified Atmosphere Packaging software system (MAP), has been upgraded and optimised to identify optimal O2 and CO2 concentrations in headspace and spoilage as a function of time. This has enabled measurements of respiration characteristics of any kind of fresh berries and determination of the shelf-life in given conditions, which will be a real added value for the stakeholders
- Pulsed electric field (PEF) and ultrasound (US) coupled with osmotic dehydration (OD) has been applied to improve functionality of semi-dried products. The mild technologies enabled preservation of the microstructures and the fresh-like characteristics of berries and fruits.
- The use of edible coatings in improving the shelf-life of blueberries was investigated and found to improve firmness, colour and reduce the growth kinetics of yeast and mesophilic aerobic bacteria.
- Microwave assisted extraction (MAE) of phenolic compounds in berries was optimised using response surface methodology. The results showed that 86% of the phenolics of blueberry and 88.7% of phenolics of strawberries could be extracted in short time.
- Drying and fractionation techniques were found to be useful for production of bilberry powders with preserved qualities and potential application as functional ingredients in e.g. dairy products
- The microbiological safety (especially mycotoxins) of pre-treated and processed berry and fruit products was evaluated and found to be good for all products
- Within the project, innovative berry ingredients and products have been produced, such as functional powders, healthy extruded snacks and 3D printed confectionaries.
- High-pressure homogenisation (HPH) was applied to organic juices of blueberries and kiwi fruit and demonstrated to increase shelf-life considerably (for blueberry juice 2 months at both cold and ambient storage and for kiwi fruit juice > 40 days at cold storage).
- A literature study has been made to identify important quality parameters limiting shelf life during storage of berries and a report on technical specifications has been delivered.
- Storage tests of fresh berries have been performed to analyse quality parameters at different temperature and humidity conditions and for validation of the mathematical model implemented in WP2. The recommendation is to store berries cold and in closed packages.
- Consumer behaviour studies have been made to identify factors that influence berry consumption in cross-national surveys. Consumers show high interest in products that are free from additives, with high nutritional content and organic. Consumer acceptance and con-joint studies have been conducted for dried organic strawberries. The conjoint studies were useful to obtain information of important aspects of design of new food products and packaging.

The project final web monitoring meeting was held on 5 September 2018 where an overall implementation was evaluated positively and project report was approved where no specific amendments requested. The project results were presented at the final Research Seminar on 9 October 2018.

FaVOR-DeNonDe project

The project focuses on processing techniques with the aim of comparing industrial and home-made methods *vs* innovative and sustainable ones, specifically recommended for organic products and for small productions. In the final report partners noted that 'the project achieved its objectives, with the main one represented by the determination of compositional changes in differently processed samples of organic

fruit and vegetables. The main change in quality indexes regarded the different sustainable and small-scale processing techniques, compared with traditional and home-made ones. Another source of variability has been given by the different genotypes used for the experiments: this mean that an important factor for quality assessment during the processing chain is the correct choice of the genotype, or cultivated variety. A deep work on the compositional profile for "desired" and "non-desired" compounds of the raw and the processed products were performed and the resulting data were correlated to the sensory data.
A relatively unexpected aspect was the big variation within different sampling years, but this can be justified by the deep climatic changes over the two main years of sampling, especially in Northern Europe.
Just as an example, plums from Norway were harvested on 22 September in 2015, and on 6 September in 2016. Generally, little variations were seen from the ORG-CONV comparison, some changes were detected in raw, untreated samples whereas these differences disappeared in processed products.'
The project final web meeting was held on 12 September 2018 where an overall implementation was evaluated as timely. The funding partners request some amendments in relation to the abstract of the project report that were provided by coordinator and project report was approved where no further amendments were requested. The project results were presented at the final Research Seminar on 9 October 2018.

SusOrganic project

The SusOrganic project aimed to develop improved drying and cooling/freezing processes for organic products in terms of sustainability and objective product quality criteria. Initially, the consortium focused on a pre-defined set products to investigate (fish, meat, fruits and vegetables). Contacting participants in the fruit and vegetable sector showed that there is only little perceived need for making changes for the improvement of the processes. At the same time, it became clear that hops and herb producers (drying) face several challenges in terms of product quality and cost of drying processes. Therefore, the range of products was extended to these products.
The results of a consumer survey conducted as part the project showed clearly that consumers trust in the organic label, but also tend to mix up the term organic with regional or fair-trade. Further, the primary production on farm and not the processing is explicitly included in the consumers' evaluation of sustainability. Appearance of organic products was found to be one of the least important quality criteria or attributes regarding buying decisions. However, there are indications that an imperfect appearance could be a quality attribute for consumers, as the product then is perceived to be processed without artificial additives.
Regarding drying operations, small scale producers in the organic sector often work with old and/or modified techniques and technologies, which often leads to an inefficient drying processes due to high energy consumptions and decreased product quality. Inappropriate air volume flow and distribution often cause inefficient removal of the moisture from the product and heterogeneous drying throughout the bulk. Guidelines for improvement of the physical setup of existing driers as well as designs for new drying operations, including novel drying strategies were developed.
Besides chilling and freezing, the innovative idea of superchilling was included into the project. The super-chilled cold chain is only a few degrees colder than the refrigeration chain but has a significant impact on the preservation characteristic due to shock frosting of the outer layer of the product and the further distribution of very small ice crystals throughout the product during storage. Super-chilling of organically grown salmon eliminated the demand of ice for transport, resulting in both, a reduction of energy costs and

a better value chain performance in terms of carbon foot printing. This is mainly due to the significantly reduced transport volume and weight without the presence of ice. The product quality is not different but the shelf life is extended compared to chilled fish. This means that the high quality of organic salmon can be maintained over a longer time period, which can be helpful, e.g. to reach far distant markets. The same trend was found for superchilled organic meat products such as pork and chicken.
The consortium also developed innovative non-invasive measurement and control systems and improved drying strategies and systems for fruits, vegetables, herbs, hops and meat. Those systems are based on changes occurring inside the product and therefore require observation strategies of the product during the drying process. Through auditing campaigns as well as pilot scale drying tests it has been possible to develop optimisation strategies for both herb and hops commodities, which can help reduce microbial spoilage and retain higher levels of volatile product components whilst reducing the energy demands. These results can be applied with modifications to the other commodities under investigation. The environmental and cost performance of superchilling of salmon and drying of meat, fruit and vegetables were also investigated and the findings indicated that both superchilling and drying could improve sustainability of organic food value chains especially in case of far distant markets.
An additional outcome of the project, beyond the original scope was the development of a non-invasive, visual sensor based detection system for authenticity checks of meat products in terms of fresh and pre-frozen meats. The project final web monitoring meeting was held on 10 September 2018 where an overall implementation was evaluated positively and project report was approved where no specific amendments requested. The project results were presented at the final Research Seminar on 9 October 2018.

Deviations and impact on other tasks:

Despite requested project extensions, none of the projects had unsolvable problems during the final phase of implementation and during the final reporting. The funding bodies are in general satisfied with their final outcomes.

Task 4.3 Organisation of expert reviews (task leader BMLFUW)

The objective of the task was to review the final reports by engaging at least two experts per project report and ask them to provide recommendations for the approval/amendments that could be considered by the funding bodies. The task leader requested to reallocate this task and ICROFS had possibility to partially cover the planned activities. The same experts that evaluated the original project applications were invited to provide their opinions for those projects that had the web meetings in autumn 2018. There were three experts engaged and they commented on four different projects. Their input was valuable as these projects were discussed in the web evaluation meetings involving limited number of funding bodies, while other projects were evaluated during the face-to-face meetings allowing broader discussion and participation of all CO funding/stakeholder partners.

Deviations and impact on other tasks:
The task leader BMLFUW requested to reallocate the task responsibility to another partner due to limited number of personnel. The task was reallocated to ICROFS and it was organized differently as not all projects had additional expert review. The funding bodies received an indication from external experts before the monitoring meeting not as planned together with the report.

The impact assessment in Task 5.3. did not use the information from this task and the assessment was organized gathering and using the data following an agreed methodology (Pedersen et al. 2011). A different organization of the task 4.3 did not affect implementation of other tasks.

WP5 Dissemination and impact

Objectives of the period:

- To publish information on CO and the funded projects via different dissemination tools such as websites, newsletters, etc.,
- To improve and disseminate project/research results nationally and internationally to stakeholders and end users (e.g. via research seminars),
- To improve Organic Eprints functionality and capacity for both projects and reports,
- To assess the impact of CO Plus funded projects.

Progress and results

During the reporting period, the CORE Organic website and its projects web pages have been regularly updated (Task 5.1).

Between April 2017 and November 2018, 20 online articles have been published and sent out to over 800 recipients via a newsletter (4 newsletters). In addition, 3 videos have been realised presenting the most important results of selected projects. For one of the projects we provided support to produce a technical guide, which has been translated to eight languages.

A Research Seminar was organized in Paris in October 2018 with approximately 50 participants[1]. The event provided a link between CO Plus and Cofund programme periods in order to ensure continuity and transfer of best practices among the partners (Task 5.2).

The qualitative and quantitative impact assessment of 14 CORE Organic projects of the previous CO II programme has been finalised and results have been presented and discussed in Deliverable 5.2 (Task 5.3).

Continuous support was provided to the research consortia to ensure that all relevant outcomes of the projects were uploaded to the open archive www.orgprints.org (Task 5.4).

The following activities were carried out within WP5: The CORE Organic website including 11 CORE Plus project pages have been set-up and maintained. 62 online articles, 10 videos, and eight newsletters have been produced. Two research seminars were organized. Support was provided to the consortia to upload all relevant outputs to the open archive www.orgprints.org.

Deviations and impact on other tasks:
None

[1] CORE Organic Plus consortia, project leaders and national interested stakeholders.

Task 5.1 Dissemination, external and internal (task leader ICROFS)

Progress and results

The CORE Organic Plus website (www.coreorganicplus.org) was set-up at the beginning of the project www.coreorganicplus.org. It serves as the main information dissemination platform and includes a project page for each CORE Organic Plus project. Each project webpage includes a description of background information and gives an overview of the main project activities, expected benefits, outcomes, results and impact and how to reach the target audience. Each project webpage also includes a link for the international open access archive, Organic Eprints, where papers and dissemination material from each project can be found. For each project a leaflet (see https://projects.au.dk/coreorganicplus/materials/) was produced to promote the new projects. The main activity was to maintain the website, update the website with news items from each of the CORE Organic project and ensure that the project websites were up-to-date (including making links for communication material, e.g. links for project leaflets, guidelines, news and newsletters, etc.). News stories have been generated from the projects and sent via the CORE Organic Newsletter. All Newsletters can be found here:
http://us6.campaign- archive2.com/home/?u=861c94e0d6cb4cbe98fb45d81&id=8abdff3e54.

Structure of the CORE Organic website

www.coreorganic.org is the main website of CORE Organic, which links up to each of the CORE Organic programmes (and users/visitors can also enter each site through the separate domains listed below):

- CORE Organic I
- CORE Organic II
- CORE Organic Plus
- CORE Organic Cofund

Deviations and impact on other tasks:

None

Task 5.2 Dissemination of research results for stakeholders and end users (task leader FOAG)

Progress and results

One of the main goals was to support the 11 CORE Organic Plus project consortia in their dissemination activities. 62 news-items (online articles) were produced for the CORE Organic website and newsletters. The support from the CORE Organic communication team to the consortia consisted of 1) editing the submitted texts, including adaptation to the specific requirement of online texts, and 2) writing articles based on material provided by the projects. In addition, the communication team produced 8 videos, from which 3 videos were produced at the start of the project, and the remaining at the end, presenting the most important projects' results.
In total, two research seminars were organized (Bucharest in October 2016 with approximately 60

participants, and Paris in October 2018 with approximately 50 participants[2]).
The CORE Organic Plus communication team further supported one of the projects with the concept and layout of a technical guide, which has then been translated to eight languages. This is an excellent example of how to disseminate information to target groups at the national level within European projects.
All activities are described in Deliverable 5.1.

A Research Seminar was prepared and held in Paris in October 2018. The coordinators of 11 CO Plus projects presented their main results and exchanged their experiences in 'Science bazar'. CO Plus projects – FaVOR-DeNonDe, SusOrganic and EcoBerries – related to organic food processing topic were also presented presented by their respective industry partners at the Science Day at Biofach 2018 organized by TP Organics. The EcoBerries delegation at the Biofach fair included most of the partners from the consortium. The visit to the fair was combined with the project meeting and the main aim was to connect research community and industry.

Deviations and impact on other tasks:

None

Task 5.3 Assessment of impact (task leader FOAG)

Progress and results

The impact of 14 CORE Organic II project was assessed by a) a quantitative summary of different categories of research outputs based on a number of indicators to which weights are assigned, and b) a qualitative evaluation based on interviews with project leaders and relevant stakeholders from the food and farming sector in France and Flanders (Belgium). A quantitative assessment of COII projects was carried out according to the methodology of Pedersen et al. 2011 and a qualitative assessment by interviewing stakeholders in France and Flanders. The quantitative analysis is based on the final reports of the projects, as well as on papers and dissemination activities uploaded in the Organic Eprints database. The coordinators provided additional peer reviewed papers which they published since the projects ended. A qualitative assessment was done by MAAF and ILVO by interviewing stakeholders in France and Flanders respectively. In France 26 interviews related to the Core Organic II projects: COBRA, Tilman-Org, Propig and Healthygrowth were carried out. In two videos, farmers explained their motivation to be involved in European projects. In Flanders, 18 stakeholder related to the projects COBRA, Tilman-Org, HealthyHens and Bicopoll were interviewed.

Both the quantitative and qualitative analyses have shown that CORE Organic II projects have a significant and positive impact in terms of scientific output. CORE Organic II has made international cooperation between researchers possible and laid the foundation for further cooperation. It was possible to work on research areas that would not have been tackled at national level.
Regarding the output for practitioners, however, the results must be interpreted carefully: The quantitative analysis has shown that the analyzed CORE Organic projects achieved a comparatively high output for practitioners. On the other hand, the two qualitative analyses for Flanders and France also made it clear that

[2] CORE Organic Plus consortia, project leaders and national interested stakeholders

the outputs produced are often not (yet) utilized in practice. The farmers and advisors interviewed believe that this is due to insufficient dissemination activities at the national level. This is also a major challenge in many research projects funded by the EU Framework Programmes for Research & Innovation.
Against this background, the long-term and free accessibility of research outputs via archives or knowledge portals such as www.orgprints.org or www.farmknowledge.org is a fundamental prerequisite to create impact.

Deviations and impact on other tasks:

The impact assessment was originally planned to be performed on the Plus projects. However, an assessment right after the end of the projects does not provide a fair picture because many publications are usually written after the lifetime of a project, and therefore it was decided to assess the completed CO II projects, while an impact assessment of the Plus projects has become part of the Cofund project.

Task 5.4 Maintenance and further development of the Organic Eprint archive (task leader ICROFS)

Objectives for the period

- All results generated by research projects funded by CO will be archived in the open-access archive Organic Eprints.
- Organic Eprints will also be a key source for continuous dissemination as described under task 5.2.
- The archive's functionality for research dissemination needs to be upgraded to include further development tools for international users and other improvements to manage the new capacity.
- New CO partners in the CO Plus will each appoint a national editor.
- All new national editors, including new ones from existing partners, will be trained.

Progress and results

Continuous support was provided to the research consortia to ensure that all relevant outcomes of the projects have been uploaded to the open archive. In total, more than 400 publications and other material from the 11 projects have been deposited on: http://orgprints.org/view/projects/COREplus.html.
This has been used for the newsletters, websites etc. (see Task 5.2). ICROFS has received 1 to 5 monthly requests from CORE Organic (Plus and other programs) regarding Organic eprints, which have been processed, usually within one-two weeks time frame. In total, approximately 30 to 50 requests of users have been answered during the 20-month reporting period.

ICROFS has provided support for the uploading of more than 400 publications and other material from the 11 CORE Organic Plus projects. Organic eprints has been developed to better include dissemination material based upon research. New national editors have been appointed from new CORE Organic Plus countries as well as when these have needed replacement. New as well as existing national editors have received online training and support in their work handling the uploaded materials.

Problems and delays

Some national editors are not active and they have been encouraged to find replacements which could be more active in relation to the work of Organic eprints.

Project management during the period

Consortium management tasks and achievements

The management of the consortium has been running smoothly and the partners have often expressed their satisfaction. The project secretariat has a daily contact with the partners providing continuous support. The coordinator (ICROFS Director) changed during the 3rd reporting period, while both the director and previous project manager are still employed at the Aarhus University and available to provide support when historic aspects of the ERA-Net are needed. The previous project manager took the lead in harvesting the learnings from the Plus call to create the Cofund project on solid grounds. Partners have in several rounds of questionnaires and have expressed their wishes for how the next call should be built, based on their experiences from the all CO calls and their participation in the other ERA-NETs. The current project manager has taken the initiated process further in order to explore the possibility of joint call with ERA-NET SUSFOOD2 Cofund in 2019 in relation to the food systems.

The most important learnings from the Plus call implementation are the following:

- Project coordinators are paid by the EU funds and not by the national funding body. The reason for testing if this would be beneficial for the management of the projects is that the national rules in some of the partner countries do not allow enough funds to be requested for coordination. A transnational project has more demanding management needs than a national project. Another reason is that the project coordinators are very often from the same countries, the countries that have sufficient funds to pay both coordination and research work. The partners would like to spread out the coordination role to more countries and allow the best coordinator to be chosen by the consortia. The request came from a project coordinator of a COII project.
- Criteria for the selection at step 2 have been agreed to and written into the Consortium Agreement.
- The overlap of two project periods CO Plus and Cofund provided possibility to gather an additional knowledge related to the Call mechanism and identify key aspects to work on. The consortium has to: 1) ensure more structured feedback to the researchers, 2) identify further ways of harmonization of procedures and national rules that are to be respected in the research proposals, and 3) quicker implementation of consortium decisions on the national level among the funding partners (i.e. project contracting).

List of project meetings, dates and venues

The list of project meetings, dates and venues can be found in Table 3. The continuous project planning was performed in the MB by regular bi-monthly meetings. All minutes are available in the closed section for partners at: http://projects.au.dk/coreorganiccofund/, “login Governing Board” on the left side, user name: “gbdoc2017” and password: “coreorggb2017”, under the folder “Documents from Board meetings”. The documents are included in the closed section for partners at the CO Cofund web site as it is managed by ICROFS, while the CO Plus closed section updates are managed by the external experts from Aarhus University due to the creation of new web installation and two different domain names. This change does not influence the project content on the CO Plus website.

Table 3. List of project meetings, dates and venues

Project meetings	Dates	Venues
CO Plus Final Research seminar (Workshop)	9 October 2018	Paris (FR), invited by MAA.
Joint Plus and Cofund MB meetings	16 May 2017 19 June 2017 12 September 2017 10 October 2017 07 November 2017 02 December 2017 08 January 2018 06 March 2018 08 May 2018 03 July 2018 04 September 2018 06 November 2018	Web meetings (Adobe connect)

Project planning and status;
The MB meetings contained an agenda point on management, budget and planning which was presented by the project manager.

Impact of possible deviations from the planned milestones and deliverables, if any;
None

Any changes to the legal status of any of the beneficiaries, in particular non-profit public bodies secondary and higher education establishments, research organisations and SMEs;
There were number of changes in funding institutions names that will be taken further as a part of amendment procedure in the Cofund programme phase.

Development of the Project website, if applicable
The CO Plus website keeps being maintained, even though the CO Cofund website has been made as a new web installation with its own domain name. Both websites are placed on servers, owned and maintained by Aarhus University.

Problems which have occurred and how they were solved or envisaged solutions;
None

Changes in the consortium, if any;
The coordinator (ICROFS Director) changed and new director was appointed from 1 January 2019. The coordination role of the CO Project Secretariat remained within ICROFS and the changes did not impact the overall CO programme project implementation.