



## Annual Status Report 2001 and Application for Continuation in 2002

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The Directorate for Food, Fisheries and Agro Business  
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### 1. Research program

Research in organic farming 2000-2005 (DARCOF II)

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### 2. Project title and number

III.5 Nature Quality in Organic Farming

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### 3. Head of project

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- 7. Start of project: 2001**  
**End of project: 2004**
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## 8. Annual report/Application for continuation in 2002

### A. Objectives and expected achievements (from application)

The overall aim of the project is to identify the key components that ensure a continuous development of organic farming towards a closer integration of nature quality with food production. To accomplish this, the project will develop a common platform of understanding of how the localisation, diversity and intensity of organic farms influence landscape and nature quality (Driving forces and Pressure indicators). WP 2 will achieve this. This platform will qualify and give perspective to the discussion of how the three major components (State-Impact indicators) of nature quality as identified recently (Tybirk & Alrøe 2001) can be combined locally and regionally:

- biological diversity (WP 3)
- ecosystem functioning (WP 4)
- esthetical landscape perception (WP 5)

The project will develop relevant definitions and simple indicators to identify each aspect separately.

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However, the multi-disciplinarity of this project gives us an opportunity bring the separate analysis together and investigate how these potentially conflicting considerations can be integrated (WP 1) and suggest future pathways for the development of organic farming. The project will focus on identifying relationships between the three aspects separately and in combination, and scenarios will be used to show the consequences of organic farming practices for selected nature quality aspects.

The project is expected to achieve detailed information on the historic development of localisation of organic farms and the conditions that influence this. The organic farmers, their farming practices, their intentions and actual ability to conserve and promote biological and ecological as well as esthetical qualities will be characterised in details with the aim of identifying barriers and possible solutions for the development of organic farming. The project will be able to characterise organic farmed landscapes and their biological attributes and develop tools for communication of different conceptions of nature.

Relevant indicators will be developed to enable farmers, the public and the administrative bodies to set goals for an integration of nature quality considerations in the future development of a sustainable organic farming on the habitat, the farm and the landscape level. These indicators will also be appropriate to measure whether organic farming is actually approaching these goals.

## **B. Project summary (from application)**

Organic farming is an alternative to the intensification and specialisation of agriculture. However, the expectation that organic farming also favours land use and farm practises that supports ecosystem functioning and to a higher extent contribute to nature qualities are generally not well documented.

The proposed project considers the *biological*, the *agricultural* and the *esthetical* aspects of nature quality in organic farming. The overall research question is under which conditions it is possible to favour a high biological diversity in a high yielding organic production system that supports esthetical and recreational opportunities. The farmer and the public may have different priorities, but all three aspects need to be addressed in order to give complete answers.

- Work Package 1 is the forum that brings the researcher in the project together to exchange data, results and ideas, and ensures that appropriate indicators and necessary tools for communication and planning are developed. An important feature is the interrelated research topics (cross-cuttings) based on the broad interdisciplinarity of the project group and the exchange of common data.
- The conversion process and the motivations behind will be analysed in WorkPackage 2 where the geographical localisation, the diversification and the extensification of the farms is related to the landscape and nature qualities of the farms.
- Work Package 3 develops models and principles for the conservation of biological diversity on organic farms including methods to identify areas of interest and indicators to follow the development.
- Work Package 4 examines the conditions for a positive relation between a high crop production and species rich and varied ecosystems on the cultivated fields.

Work Package 5 analyse the farmer's conception and how it is reflected in the aesthetics and nature values on the farm and develops new instruments of communication on nature and landscape quality.

**Table 1: Work package list (from application)****Table 1. List of Workpackages.**

Work-package no	Title	Budget (Mill. Dkr)	Responsible	Start	End	Deliverable no
1	Project management and interactions	0.4	JFr	2000	2004	D1-12
2	Localisation, diversification and extensification in organic farming	2.0	PFr	2000	2004	D13-22
3	Biological diversity and organic farming	3.2	REj	2000	2004	D23-30
4	Ecosystem diversity and function of the fields in organic farming	3.8	JAA	2000	2004	D31-39
5	Organic Farming and Landscape Quality – Perceptions and Practices	2.0	KHø	2000	2004	D40-48

## C. Progress

### C.1 Annual description (resume) of main results and conclusions

### C.2 Fulfilment of tasks and deadlines in individual work packages (To be completed for each work package)

WP number and title	Time schedule according to application	Deviations, if any*
<b>WP 1: Project management and interactions</b>		
<i>Task</i>		
1. Project co-ordination		
2. Cross-cuttings		
<i>Deliverables</i>		
Starting-up seminar	04.01	09.01
Annual co-ordination meeting	01.02-04	
Annual status report	01.02-04	
CC <sub>1</sub> Impact of farm localisation and character on biological diversity.	03.02	
CC <sub>2</sub> Farm management, ownership, collaboration, value conceptions and nature values.	10.04	
CC <sub>3</sub> Farmers conception of nature and actual biological quality of his farm.	12.03	
CC <sub>4</sub> : Workshop on the aesthetic perception of biological quality.	10.02	
CC <sub>5</sub> Functional interpretation of the response of arthropods to the organically farmed landscape.	03.04	
CC <sub>6</sub> : Correlation between vegetation and beetles in hedges.	06.04	
CC <sub>7</sub> Landscape scenarios.	06.03	
CC <sub>8</sub> Workshop on identified correlations.	09.03	
CC <sub>9</sub> : Workshop on Indicators.	03.04	
<i>Milestones</i>		
Starting up seminar	04.01	
Annual co-ordination meetings	01.02-04	
CC1. Impact of farm localisation and character on biological diversity.	03.02	

CC2. Farm management, ownership, collaboration, value conceptions and nature values.	10.04	
CC3. Farmers conception of nature and actual biological quality of his farm	12.03	
CC4. Workshop on the esthetic perception of biological quality.	10.02	
CC5. Functional interpretation of the response of arthropods to the organically farmed landscape.	03.04	
CC6: Correlation between vegetation and beetles in hedges.	06.04	
CC7. Landscape scenarios of changing into organic farming.	06.03	
CC8. Workshop on identified correlations.	09.03	
CC9. Workshop on Indicators.	03.04	
<b>WP 2: Localisation, diversification and extensification in organic farming</b>		
<i>Task</i>		
1. Regional analysis of organic farms in Denmark		
2. Selection of case areas		
3. Local social and cultural context		
4. Production, diversity and nature practice on existing farms		
5. Structural farm characteristics and nature practise		
6. Changes in farm diversity		
7. Landscape changes following conversion to organic farming		
8. Forms and levels of organisation for management of nature quality		
<i>Deliverables</i>		
Spatial statistical description of farm types, densities and land use intensity	05.02	
Regional processes in Danish organic production	04.04	
Social relations and spatial pattern: case area 1	03.03	
Social relations and spatial pattern: case area 2 and 3	12.03	
Integration of spatial and social processes in organic farming	12.04	
Database fully available for cross-cuttings	02.03	
Production, diversity and nature practise on existing organic farms in Denmark	12.03	
Changes in farm diversity and nature practise with conversion to organic farming	05.04	
The impact of organic farming on landscape structure and -change	09.03	
Potentials of among-farm collaboration for management of nature and landscape qualities	05.04	
<i>Milestones</i>		
M1: National analysis of localisation and diversity completed	06.02	
M2: Landscape analysis completed	06.03	
M3: Historical analysis completed	12.03	
M4: Localisation of organic farms completed, two case areas selected	09.01	
M5: Additional case area(s) selected	06.02	
M6: Interviews with key persons, case area 1 and 2	03.02	
M7: In depth interviews completed, case area 1	08.02	

M8: In depth interviews completed, case area 2 and 3	09.03	
M9: Farm information from central registers retrieved	09.01	
M10: Survey scheme designed and tested	03.02	
M11 Survey in case areas completed	12.02	
M12: Data analysis completed	06.03	
M13: Conversion data from applications for autorisation processed	03.03	
M 14: Supplementary interviews completed	06.03	
M15: Data analysis completed	12.03	
M16: Data retrieved	08.01	
M17: GIS analysis of landscape structure completed	12.02	
M18: Supplementary information retrieved	03.03	
M19: In-depth interviews carried out	08.03	
<b>WP 3. Biological diversity and organic agriculture</b>		
<i>Task</i>		
1. Floristic inventory of organic farms		
2. Experimental test of colonisation limitation		
3. Gradient analysis and modelling of biological diversity		
4. Synthesis – models, indicators and principles		
<i>Deliverables</i>		
The contribution of organic agriculture to biological diversity	07.02	
Manuscript: The importance of colonisation limitation for the diversity of grassland and hedgerows on organic farms	12.03	
Manuscript: Gradient analysis of plant and invertebrate communities in organic farms	03.04	
Manuscript: Predicting plant and invertebrate diversity in grassland habitats of organic farms	03.04	
Manuscript: Functional interpretation of the distribution of arthropods in the agricultural landscape	05.04	
Indicators for habitat quality in organic agriculture	09.04	
Impact of farm localisation and land use on biological diversity	09.04	
Integration of biological conservation into organic agriculture	12.04	
<i>Milestones</i>		
M20: 30-50 farms selected	06.01	
M21: Field inventory completed	09.01	
M23: Statistical summary for area, farm, and species data	03.02	
M24: Experiment established	09.01	
M25: Recording of first year establishment in experiment	10.02	
M26: Recording of second year survival in experiment	10.03	
M27: Statistical analysis of experiment completed	12.03	
M28: Selection of sample sites	03.02	
M29: Completed sampling of plants	09.02	
M30: Completed sampling of arthropods	09.02	
M31: Completed identification of arthropods	08.03	
M32: Completed sampling and analyses of environment	10.03	
M33: Gradient analyses and statistical models....	12.03	
M34: Tests for hypothesised relationships	02.04	
M35: Completed analysis of indicators and models for prioritisation....	06.04	

<b>WP 4. Ecosystem diversity and function of the fields in organic farming</b>		
<i>Task</i>		
1. Development of indicators of nature quality on organic fields.		
2. A test of the hypothesis that increased biodiversity enhances the beneficial ecological mechanisms		
3. Modelling of consequences of crop rotations, tillage and landscape structures on mobile organism		
<i>Deliverables</i>		
Suggestion to indicator system	09.04	
Scientific paper on indicator system	12.04	
Suggestions for changes in management practice to promote desirable species in organic fields	12.03	
Scientific paper on crop rotations and polyphageous predators	12.02	
Scientific paper on the connection between soil fauna and polyphageous predators	12.03	
Scientific paper on the relation between biodiversity and aphid control	12.03	
Entry at the Danish Plant Protection conference	Every March	
Scientific paper on the impacts of various organic farm practices on the mobile organisms	09.03	
Scientific paper on the impacts of farm location on the mobile organisms	09.03	
<i>Milestones</i>		
M36: Plan for low intensity sampling ready	03.02	
M37: Low intensity sampling finished	06.02	
M38: Low intensity data treatment finished	12.02	
M39: Tentative indicator system designed	03.03	
M40: High intensity sampling plan ready	03.03	
M41: High intensity sampling finished	09.03	
M43: High intensity data treatment finished	03.04	
M44: Detailed research plan for the year is developed	03.02-04	
M45: Additional extractors manufactured	06.01	
M46: The years experiments finished	03.02-04	
M47: ALMSS increased to be able to make generalised predictions.	08.02	
<b>WP 5. Organic Farming and Landscape Quality – Perceptions and Practices</b>		
<i>Task</i>		
1. Landscape analysis		
2. Analysis of the farmer's role in the production and maintenance of nature and landscape quality		
3. Development of methods for communication about nature and landscape quality		
<i>Deliverables</i>		
The aesthetic perception of biological quality	06.02	
The aesthetic perception of biological quality	12.02	
The aesthetic quality of organically farmed landscapes	02.04	
Nature and landscape quality – organic farmers value conceptions	12.03	

Value conceptions, farm maintenance and biological quality	08.04	
The contribution of farming practice to aesthetic quality	08.04	
Local participation in nature and landscape quality assessment	12.04	
Operational indicators in communication and decision-making processes	10.04	
Indicators for nature and landscape quality as instruments in awareness raising and decision-making	12.04	
<i>Milestones</i>		
M48: Selection and description of study areas	12.01	
M49: Landscape analysis	06.02	
M50: Basic interviews	06.02	
M51: Collection of production data	12.02	
M52: Collection of biological data	09.02	
M 53: Analysis and description of aesthetic landscape quality	03.04	
M55: Data collection – individual interviews	07.02	
M56: Data analysis – individual interviews	03.03	
M57: Data collection – focus group interviews	12.02-06.03-12.03-06.04	
M58: Data analysis – focus group interviews	12.04	
M59: Development of indicators	06.04	
M60: Interviews with key persons, case area 1 and 2	12.04	
M61: Synthesis of objectives	12.04	

\* *Deviations are to be further discussed at C3*

### **C.3 Discussion on the progress, incl. deviations and achievements in the project as a whole and in the individual work packages and**

The starting up seminar was held during 24-25 September 2001. The WPs presented and discussed detailed programme of work and special emphasis was given to discuss the crucial Cross-Cuttings in the project. The deliverables were adjusted in accordance with the budgetary restrictions the project faced which influence on some of the common deliverables (cross-Cuttings etc.). CC6: Correlation between vegetation and beetles in hedges. Deleted due to budget reductions in Wp 3 and 4.

WP2 undertook preliminary analyses of farm localisation and farm types in May-June 2001, with the purpose of selecting two case-study areas for use in the wp3 plant inventory, which was carried out during summer 2001. WP 4 has not yet started the work (postponed to 2002).

Unfortunately, the Ph.D. student who was related to workpackage 2, quitted the job in august, and preparations for replacement have since been undertaken.

### **D. Description of plans and future work in the project as a whole and in the work package (Including plans for publication and communication)**

The project as a whole is expected to run as planned, though delayed due to late project start. A new Ph.D. in WP2 is expected to start primo 2002. A two days workshop in WP2 has been planned, and it is expected to circulate a draft of a questionnaire to the rest of the program participants in December.

**E. Project publications**

No publications after the first 3 months

**F. Scientific education (ph.d. and post doc.), including visiting scientists and visits abroad**

Two phd.students are expected to be involved in WP2 and WP3

**G. National and international co-operation**

**H. Possible elaboration of project and achieved results**

