



**Country Report on  
Organic Farming Research  
in Norway**

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## 1. History

### The growth of Organic Food and Farming

In 1986, only 19 farms in Norway were certified for organic production. Initiatives in the 1990s encouraged many farmers to convert and the number of organic farms increased from 423 in 1991 to 2,486 in 2005 (statistics: [www.debio.no](http://www.debio.no)). In the same period, the area of organically certified farmland and land in conversion increased from 2,443 ha to 43,034 ha, about 3.5 % of the total farmland.

In 1999, the government put up a specific goal for the development of organic farming, stating that 10 % of the agricultural land shall be managed according to organic standards within 2010 (White Paper from the Ministry of Agriculture,<sup>1</sup> 1999). However, a pre-requisite for this goal is that the demand for organic products increases in accordance with the increasing production. According to the White Paper, organic farming methods contribute to food safety, greater product diversity, environmental benefits, sustainability and enhanced farm incomes. In October 2005, Norway elected a new government that has declared to strengthen the public goals for organic agriculture, as well as the public resources to research. The new aim is that 15 % of the Norwegian food production and 15 % of the food consumption shall be organic within 2015. In order to achieve the 10 %-goal by 2010, about 1,250 farmers have to convert to organic farming annually during the next four years. This number comprises 2 % of the present conventional farmers. However, the need for farmers to convert is even higher, since approx. 200 organic farmers annually have reverted from certified organic production during the last few years. Research is regarded as one important means to increase the volume of Organic Food and Farming (OF&F).

Several ideological sub-groups participate in the OF&F movement, e.g. biodynamic farmers, Adventists and others. In Norway, as in most other countries, some disagreements have occurred, but in general, the groups within the organic movement have been cooperating and the movement is commonly regarded as a unity. There is for example only one body to certify and one label to define organic produce. The label is a green Ø (“Økologisk” means Organic), and biodynamic products receive the Demeter label in addition (Figure 1).

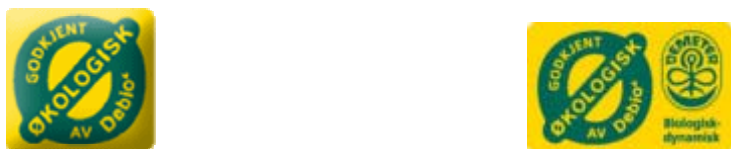


Figure 1. The label to identify organic products in Norway is a green “Ø”, the first letter of the word “ecological” in Norwegian. Biodynamic products additionally receive the Demeter label.

### The first OF&F research

The research in organic farming in Norway started with MSc theses work by students at the Agricultural University of Norway (now: Norwegian University of Life Sciences, UMB) at the end of the 1970s.

Public research funding for OF&F was first provided in 1985, when the Research Council of Norway (at that time, The Norwegian Research Council of Agricultural Science, NLVF) funded a project focussing on nutrient supply in organic dairy farming. The project was carried out by the Norwegian Crop Research Institute (since January 1, 2006: Bioforsk Norwegian Institute of Agricultural and Environmental Research). Public funding for OF&F research was regarded as an important milestone among stakeholders within the organic movement. The project granting was

<sup>1</sup> The title of the White Paper: Stortingsmelding 19 (1999-2000). Om norsk landbruk og matproduksjon (About Norwegian agriculture and food production). The Royal Ministry of Agriculture, 161 p.

seen as a result of the efforts and enthusiasm of organic pioneer farmers in Mid-Norway, who had established the first advisory service within organic farming in 1980. In 1985, the first course in organic farming methods was established at the Agricultural University of Norway (now UMB). In 1986, the Norwegian Centre for Ecological Agriculture (NORSØK) was founded, with the aim of developing organic farming in Norway. Since January 1, 2006, NORSØK is included in Bioforsk as the Organic Food and Farming Division.

An important step forward in Norwegian OF&F research was an extensive whole farm case study project (1989-1997) funded by the Agricultural Agreement Research Fund (AA-funding, see chapter 4). The project produced results demonstrating the agronomic and economic performance of organic farming and studied the social challenges linked to this change in agricultural practice. The project also introduced organic farming in regions of the country where it was still very rare. A range of research institutions, farmers and agricultural advisers participated, which coordinated by NORSØK.

A research programme for OF&F was carried out by RCN (NLVF) during 1992 -1996, with a total funding of approx. € 2.2 million. Since then, OF&F research has competed with general OF&F research for funding in RCN programmes. AA-funding has funded a range of OF&F research projects since 1989, and in 2004, research funding was created by a small tax on agricultural products, Levy funding was for the first time used to support OF&F projects (see chapter 4). In line with the increasing project funding, several research institutes, universities and other organisations have allocated their own economic resources and labour to OF&F research. Thematically, plant production, crop protection and animal husbandry were the focus areas of the first decade of OF&F research, as will be discussed in later chapters.

## Present strategies

To increase organic production and achieve the official aims, the Ministry of Agriculture and Food (until 2004: the Ministry of Agriculture) has developed a national policy specifically targeting organic farming. This is described in the action plan *Prioritised Areas within the Food- and Agricultural Research*, which is linked to the White Paper of 1999. Organic farming is one out of seven topics to be prioritised for research funding. For this farming method, the Ministry considers the following needs to be of greatest importance: To reduce various biological and economical risks linked to production; to increase the diversity and quality of organic products in the market and the general knowledge of organic markets and consumers; and to increase the knowledge of the whole value chain from production via processing to distribution of organic produce. An Action Plan for Organic Production and Sales launched by the Norwegian Agricultural Authority (SLF) in 2000, and revised in 2003, states that a range of organisations and stakeholders should feel responsible for contributing towards reaching the official aims. The RCN should have a coordinating role and cover all areas of organic research. Over the years, the main funding sources for OF&F research (the RCN, AA-funding and Levy funding, see Chapter 4) have become increasingly coordinated. For all research projects funded by these bodies, the RCN is responsible for the proposal procedures and quality control. However, the use of funds is decided upon by discussions between the individual funding boards. The funding for a specific project is often composed of contributions from more than one funding body.

In later years, the government has paid more attention and devoted relatively more resources to OF&F development projects than to research projects. Market development has been regarded as the crucial task, in order to increase the demand for organic products. The Norwegian Agricultural Authority (SLF) administrates approx. € 5 million per year of public funding for development projects within the OF&F sector (38 mill. NOK in 2005 and 2006). SLF projects are not described in this report.

It is challenging to draw a clear line between OF&F development and research projects, but in this report we have chosen to define OF&F research projects as the projects funded by the three funding bodies mentioned above (the RCN, AA-funding and Levy funding).

Norway is a large country with a small and scattered population (4.4 million). The regional research within OF&F is usually of limited scientific value at an international level.

### **Timeline for Norwegian research in Organic Food and Farming**

*Table 1. Timeline for development and research in Organic Food and Farming in Norway 1981-2005*

1977	Research in organic farming was initiated by students as a part of their MSc theses at the Norwegian University of Life Sciences, UMB (at that time: the Agricultural University of Norway)
1981	The Research Council of Norway, RCN (at that time: the Norwegian Research Council of Agricultural Science - NLVF) appointed a committee to describe the status, research needs and future potential for organic farming in Norway. A report was delivered in 1983
1985	The first organic research project was funded by the RCN (NLVF)
1985	UMB started education in organic farming methods
1987	The first public funding was given to Norwegian Centre for Ecological Agriculture, NORSØK (now Bioforsk Organic Food and Farming Division)
1988	Whole farm case studies were initiated by the Agricultural Agreement Research Fund
1990	Economic support for conversion to organic farming and to organic production introduced by the Ministry of Agriculture
1991	An RCN (NLVF)-appointed committee suggested future research within OF&F
1992	First research programme on OF&F was launched by the RCN (NLVF)
1994	Organic farming was officially approved as a part of the EEA-agreement (European Economic Area)
1997	NORSØK was approved as research institute and national centre of competence
1998	Professorship in agroecology, including organic farming, was established at UMB
1999	Official goal of 10 % organically managed farmland within 2010, declared in White Paper by the Ministry of Agriculture
2000	The first Action Plan for Organic Farming was launched by Norwegian Agricultural Authority (SLF)
2003	SLF action plan revised, more emphasis on market development
2004	An RCN-appointed committee suggested priorities for future research within OF&F
2005	The largest milk company, TINE, decided that 4 % of their milk sales shall be from organic milk within 2010
2005	The new elected government declared that 15 % of the Norwegian food production and consumption shall be organic within 2015
2006	Bioforsk Norwegian Institute of Agricultural and Environmental Research was established as a fusion between the Norwegian Crop Research Institute, the Norwegian Centre for Soil and Environmental Research, and NORSØK. Bioforsk Organic Food and Farming Division is the responsible unit for the OF&F research within Bioforsk.

## 2. Organisation

### Research activities, participants

The Norwegian Crop Research Institute (NCRI) and the Norwegian Centre for Ecological Agriculture (NORSØK) were the main actors within OF&F research in Norway in the period from 1985-2005. After these institutes merged with the Norwegian Centre for Soil and Environmental Research (Jordforsk) to form Bioforsk, they aimed to be a central part of the future agronomic research in OF&F. Bioforsk has seven research divisions, which consist of one or several departments located in various regions of the country (more at [www.bioforsk.no](http://www.bioforsk.no)). The employees at Jordforsk have been transferred to the Bioforsk Soil and Environment Division. The employees at NORSØK have been transferred to Bioforsk Organic Food and Farming Division, which is the responsible unit for the OF&F research within Bioforsk. NORSØK continues to exist as a foundation with the aim of developing organic agriculture in Norway.

The Norwegian University of Life Sciences, UMB (until 2004: the Agricultural University of Norway) conducts several OF&F research projects, and offers an international master programme in agro ecology which covers organic farming. This programme has been developed through Nordic collaboration in the Nordic School of Agroecology/Ecological Agriculture (AGROASIS, <http://www.agroasis.org/>) under the NOVA University Network. The NOVA University Network is a cooperation between the agricultural, forestry and veterinary universities in Denmark, Sweden, Finland, Iceland and Norway.

In a period with shrinking enrolment to university studies in agriculture, this programme attracts more students every year, and in 2005, 21 students from 11 different countries were participating.

Hedmark University College also conducts OF&F projects and offers a bachelor study in organic farming.

The Norwegian Agricultural Extension Service (LFR- Landbrukets forsøksringer) is owned and governed by 28,500 active farmers. The service body has 83 regional extension groups covering all of Norway, out of which 17 focus on organic agriculture. Hence, all districts in Norway offer professional consulting in both organic and conventional farming, and the extension service is cooperating as one big system with local ownership, but central oversight. This organisation is a very central research disseminator, and has been involved in some OF&F research projects as well (see chapter 3).

Several other research institutes and universities are also involved in OF&F research. The most active research, teaching and extension institutions within OF&F are represented in a board called “The Research Panel for Ecological Agriculture”, listed in table 2. Some other universities and research institutes (the University of Tromsø, the Norwegian University of Science and Technology, the University of Oslo and the Norwegian Institute for Urban and Regional Research) have also been responsible for research projects in OF&F, but do not participate in the panel.

*Table 2. Overview of Norwegian research institutions participating in the research panel for ecological agriculture. H = head, M = member, D = deputy, S = secretary. The listed persons may be used as contacts for Organic Food and Farming within their institutions.*

Name of institution	Acronym, web address
Bioforsk Arable Crops Division	<a href="http://www.bioforsk.no">www.bioforsk.no</a>
Bioforsk Organic Food and Farming Division	<a href="http://www.bioforsk.no">www.bioforsk.no</a>
Norwegian University of Life Sciences	UMB, <a href="http://www.umb.no">www.umb.no</a>

Hedmark University College	HIHM, <a href="http://www.hihm.no">www.hihm.no</a>
National Veterinary Institute	NVI, <a href="http://www.vetinst.no">www.vetinst.no</a>
Norwegian School of Veterinary Science	NVH, <a href="http://www.veths.no">www.veths.no</a>
Norwegian Agricultural Economics Research Institute	NILF, <a href="http://www.nilf.no">www.nilf.no</a>
Bioforsk Soil and Environment Division	Jordforsk, <a href="http://www.bioforsk.no">www.bioforsk.no</a>
National Institute for Consumer Research	SIFO, <a href="http://www.sifo.no">www.sifo.no</a>
Western Norway Research Institute	WNRI, <a href="http://www.vestlandsforskning.no">www.vestlandsforskning.no</a>
Centre for Rural Research	CRR, <a href="http://www.bygdeforskning.no">www.bygdeforskning.no</a>
Norwegian Agricultural Extension Service	LFR, <a href="http://www.lfr.no">www.lfr.no</a>

### Stakeholder organisations

All the above-mentioned research institutions have participated in the public debate on OF&F and aim at a prolonged activity within this sector. Other important stakeholder organisations are partly public authority bodies and partly NGO's.

#### Public authority bodies

\* The Ministry of Agriculture, since 2005 called the Ministry of Agriculture and Food (MAF), actively supports organic farming to achieve the 15 %-goal.

\* Agricultural county authorities administrate some public support to OF&F in their county. Furthermore, they participate in the public debate especially at a regional level and carry out development projects within OF&F in cooperation or competition with other organisations.

\* The Research Council of Norway (RCN) is responsible for research related to food and farming in general, on behalf of the MAF, who provides the major funding resources within this sector to RCN. Food and farming research is considered as an important means to accomplish the goals of the agricultural policy.

\* The Norwegian Agricultural Authority (SLF) administrates public support to organic (and conventional) farmers and official funding for development projects within OF&F. The annual amount of funding for extension, information, marketing and national pilot projects is € 5 million.

\* The Advisory Board for Organic Agricultural Production, established and headed by the MAF, contributes to the achievement of the 15 %-goal. The Board gives advice to the Government and other decision making bodies, the farmers' organisations and other major stakeholders on topics of principal interest and relations that are essential for the further development of organic production and sale. The Board gives advice during revisions of the Action Plan for Organic Agriculture (see chapter 1) and it is responsible for ensuring that the development instruments are used in an efficient way. The board shall contribute to increased coordination and cooperation between the institutions and stakeholders that are involved in the development of OF&F. The Norwegian Agricultural Authority is the general office for the Advisory Board. The institutions participating in the Advisory Board are the Ministry of Agriculture and Food, Norwegian Farmers' Union, OIKOS (see below), Debio (see below), Norwegian Food Safety Authority, Research Council of Norway, Innovation Norway, agricultural county authorities, Federation of Norwegian Food and



Drink Industry (NBL), Federation of Meat Industry (KIFF), Coop and Federation of Norwegian Commercial and Service Enterprises (HSH).

### **Non-governmental organisations**

\* Oikos is a membership organisation with approximately 1,400 members, founded in the year 2000 to support the visions and principles of organic farming and strengthen the organic movement in Norway. The members are both producers and consumers of organic commodities. Oikos publishes the journal “Ren mat” (Pure Food) six times per year and “Grobladet” (the Herbal Magazine) four times per year.

\* Debio is a membership organisation for organisations and enterprises active within organic agricultural production, processing and consumption. The organisation has been legislated to ensure that all production, processing and sales of organic food are carried out according to the national standards. It has also been assured the right to certify biodynamic production and issue the Demeter label (Fig. 1). The national standards for OF&F are governed by the EU standards for organic agriculture.

\* The Biodynamic association has 370 members. The main task is to increase the knowledge of this farming method, by seminars, advice to farmers and trainees and cooperation with other stakeholders within OF&F. The association cooperates with Debio to certify biodynamic farming. The journal “Herba” is published by the association four times per year.

Oikos, Debio, the Biodynamic association and Bioforsk Organic Food and Farming Division have regular meetings to exchange information and facilitate cooperation.

\* The Norwegian Farmers’ Union (NB) wants to promote increased sustainability of agriculture and welcomes organic agriculture as a reference for an environmentally sound way of production, as well as a way to increase agronomic knowledge. The Union supports a national production of organic commodities that covers the consumers’ demands, for products adapted to Norwegian production conditions. NB has its own production quality assessment and documentation system (“Kvalitetssikring i landbruket”, KSL) and would like the Debio certification system and KSL to become integrated for organic farmers. The Union’s opinion is that premium prices, rather than public economic support, shall ensure an equal profit for organic and conventional farmers. In later years, the Union has focussed on the demand for increased production of organic cereals and vegetables.

\* The Norwegian Farmers’ and Smallholders’ Union (NBS) has traditionally been closer allied to the organic movement than the Farmers’ Union has been. This reflects some ideological resemblance. The opinion of NBS on organic agriculture is that this farming system represents a highly developed agronomic competence. More focus on organic food will strengthen the competence and consciousness of consumers about food production in general. Hence, a successful priority setting for organic farming may be fruitful for small-scale farming in general and efforts to increase the sales of organic produce are considered as useful.

#### **\* Environmental NGO’s**

Several NGO’s are active in Norway. In general, they are positive to organic farming, and most of them are members of the legislation body Debio (see above), as well as of the “Network for Food and Environment” (see below). Even so, the cooperation between the environmental and organic movement has not been too extensive. A possible explanation is that organic farming has to compete with other topics that cause even more enthusiasm in the environmental movement.

#### **\* Consumer NGO’s**

Consumer NGO’s are less developed in Norway than in many other countries, but the Norwegian Women and Family Association has worked actively for many years to promote organic food and food safety. There are also several networks and bodies established by environmental organisations that work to promote sustainable and organic food and non-food products, such as “Green Daily”

(the authors' translation of "Grønn hverdag") and "Network for Food and Environment". These organisations work to inform consumers and influence authorities to achieve a more sustainable everyday life.

### 3. Mapping research programmes

#### Background

Significant amounts of public funding have been used for OF&F research in Norway since 1990. All research projects and programmes presented here, have in common that RCN has been/is the funding body, or the research administrator for other funding bodies. The projects described were financed by various RCN programmes, AA-funding, and since 2004, Levy funding (see chapter 4 for definitions). Much of the research activity has also been partly financed by the basic funding of the research institutions. The amount this funding comprises is very difficult to calculate. As opposed to the situation in some other European countries, the budgets of Norwegian research projects include working costs.

Only in the period 1992-1996, there was a separate RCN programme for OF&F research. Thereafter, OF&F projects have been competing with general agricultural research for funding. On behalf of the RCN, Skutlaberg (2004) produced a list of ongoing research projects within OF&F in February 2004<sup>2</sup>, with an appendix of projects that were completed by 2004. The projects presented in this country report are based on the work by Skutlaberg, with an addition of three projects that were granted in late 2004. In 2005, no projects within OF&F were granted. Hence, by January 2006, the Skutlaberg-overview plus three projects from 2004 represents the total overview of OF&F research projects since 1990, funded by the RCN or by funding bodies for which the RCN was the research administrator. A joint targeted call for OF&F research proposals will be launched by the RCN and AA-funding in April 2006.

Summarising the research activities, it has not always been possible to draw a clear line between OF&F and other agricultural research. Projects included in the figures below have in certain cases contributed significantly to OF&F as well as to general food and farming.

#### Research 1990-2005

##### Key figures

Most relevant RCN programmes for OF&F research:

Research Programme for Organic Farming (1992-1996)

Soil and Plants (1997-1999)

Soil, Plants and Livestock (2000-2005)

Market and Society (2000-2005)

Strategic Institute Programmes

Additional funding from AA-funding and Levy funding

Number of projects: 96, out of these three were granted in 2004

Total funding: Approximately € 24 million in the period 1990-2009 (see tables 3, 4)

<sup>2</sup> Skutlaberg, A. 2004: Økologisk landbruk. Liste over igangværende prosjekter 2004-2007. Utarbeidet på oppdrag fra Norges forskningsråd. (Organic agriculture. List of ongoing projects 2004-2007. Written as a commission from RCN.) 28 p.

## Research programmes

For the period 1992-1996, an RCN research programme was devoted to organic farming with a total funding of approx. € 1.75 million. Since 1996, OF&F projects have been included in the general research programmes for agriculture. From 2000 to 2006, the main part of the OF&F research activities was financed by the RCN research programmes “Soil, Plants and Livestock” (2000-2005) and “Market and Society” (2000-2005), in addition to strategic institute programmes (see below). Ongoing OF&F projects from these programmes will take their future funding from either the “Norwegian Food from Sea and Land” (2006-2011) or the “Area and Nature-based Industrial Development” (2006-2011), see below.

Throughout the whole period, AA-funding has funded significant amounts of research within OF&F. In 2004, the Board of Directors for Levy funding for the first time decided to co-fund two OF&F projects, with a total spending of € 1.3 million for the period 2005-2009.

In addition to the RCN research programmes, AA- funding and Levy funding, an instrument called strategic institute programmes has been important within OF&F research. Such programmes were/are organised in “Strategic Institute Programmes” (1994-2005) and “Strategic Programmes for Research Institutes related to Primary Industry” (SIP-PRIM, 2006- open). The resources for Strategic Programmes were raised by a decrease in the basic funding to all research institutes in 1994. The financial resources are managed by the RCN and the proposal procedure for such programmes is the same as for research project proposals. Strategic programmes are especially devoted to strengthen the scientific competence of the participating institutes and one or more doctoral fellows are usually employed. The following Strategic Programmes have been especially important for OF&F research during the period 1991-2005: “Nutrient supply to organic farming systems with small amounts of animal manure” (1998-2003), “Mineral content in plants and mineral supply for ruminants in organic agriculture” (2000-2006), “Crop protection in organic farming” (1998-2002), “Animal health in organic farming” (1998-2003) and “Organic cropping systems for higher and more stable cereal yields” (2003-2007).

## Research areas and projects

A total funding of approx. € 10.8 million was spent on OF&F research projects, which were initiated and completed between 1990 and 2003 (Table 3). Crop and animal husbandry were the most focussed subjects, followed by studies of farming systems. Environmental issues were generally integrated into projects on other topics, such as farming systems. Hence, there are no activities listed solely under the subject area environmental aspects. The total funding for research projects, which were running or granted in 2004, comprises approx. € 13.5 million. Out of these € 13.5 million, € 5.5 million were used before 2004. All running projects in 2004 were initiated in 2000 or later (three in 2000, three in 2001, seven in 2002 and four in 2003). An exact distribution of the € 5.5 million for each of the years 2000-03 has not been available, so the best approximation is that  $5.5/4 = € 1.375$  million were used in each of the years 2000-2003, divided between subject areas as indicated in table 4.

Table 3. Distribution of project funding in the period 1990-2003 according to subject areas of Organic Eprints, for OF&F projects that were completed in 2004. Farming= Farming systems, Animal = Animal husbandry, Crop = Crop husbandry, Environ= Environmental aspects, Food = Food systems, Values = Values, standards and certification, KnowMan =Knowledge and management.

Subj/Year	90	91	92	93	94	95	96	97	98	99	00	01	02	03	Total, 1000 €
Farming					285	295	295	167	292	250	250	125			1959
Animal					118	137	137	240	291	349	343	323	323	162	2423
Crop			25	35	187	198	194	44	246	382	629	629	521	340	3430
Soil	2	3	3	3	33	35	27	53	310	310	343	293	293	17	1725
Environ															
Food								91	146	214	274	219	94	58	1096
Values															
KnowMan	7	40	40	60	20	2	4								173
TOTAL	9	43	68	98	643	668	659	595	1285	1506	1726	1477	1232	577	10806

Table 4. Distribution of project funding in the period 2004-2009 by subject areas, for OF&F projects which were running or granted in 2004. Abbreviations of subject areas are shown in table 3.

Subj/Year	Before 2004	2004	2005	2006	2007	2008	2009	Total, 1000 €
Farming								
Animal	333	398	344	306	63			1444
Crop	4086	2013	1325	1022	744	156		9346
Soil	797	284	164	84				1329
Environ								
Food			63	213	213	213	175	877
Values								
KnowMan	255	149	81					485
TOTAL	5471	2844	1977	1625	1020	369	175	13481

### Participating researchers and institutes

All universities, institutes and other organisations that were responsible for one or more of the projects listed in tables 3 and 4 are listed in tables 5 and 6.

Table 5. Private institutes and organisations responsible for OF&F research in Norway between 1991 and 2005.

Institution	Number of projects
Gilde Norwegian Meat (Northern Norway Sales Company (NNS))	1
The Norwegian Agricultural Purchasing and Marketing Cooperative (Felleskjøpet) (Dept. East-West, Div. Holstad)	1
Norwegian Gardener's Union (NGF)	1
Bioskiva A/S (private company producing plant protection agents from dried manure)	1
The Norwegian Agricultural Extension Service (LFR) Div. Middle Telemark	3
Div. East Norway Agricultural Centre, group fruit and berries	1
Div. Øko-Søn, advisory service for organic farmers in South-Eastern Norway	1
The Royal Norwegian Society for Development (RNSD)	1

Table 6. Universities and national research institutes responsible for OF&F research in Norway between 1991 and 2005. Since January 2006, NCRI and NORSØK have merged into Bioforsk.

Institution	Number of projects
<b>The Norwegian Crop Research Institute (NCRI)</b>	
Div. Research Centre Apelsvoll	12
Dep. Løken	1
Div. Research Centre Kvithamar	5
Div. Research Centre Holt	2
Div. Research Centre Crop protection	9
Div. Research Centre Ullensvang	1
<b>Norwegian Centre for Ecological Agriculture, NORSØK</b>	9
<b>Norwegian University of Life Sciences (UMB)</b> (until 2004: the Agricultural University of Norway)	2
Departments (by their names in 2005):	
Animal and Aqua Cultural Sciences	3
Plant and Environmental Sciences	8
Chemistry, Biotechnology and Food Science	1
Mathematical Sciences and Technology	2
Economics and Resource Management	1
<b>Norwegian School of Veterinary Science (NVHS)</b>	3
<b>National Veterinary Institute (NVI)</b>	3
<b>University of Tromsø (UiT), Dep. of Biology</b>	2
<b>The Norwegian University of Science and Technology (NTNU)</b>	
Dep. of Social Anthropology	1
Dep. of Geography	1
<b>University of Oslo (UiO), Dep. of Nutrition</b>	1
<b>National Institute for Consumer Research (SIFO)</b>	2
<b>Norwegian Agricultural Economics Research Institute (NILF)</b>	2
<b>Western Norway Research Institute (WNRI)</b>	1
<b>Centre for Rural Research (CRR)</b>	1
<b>Norwegian Institute for Urban and Regional Research (NIBR)</b>	5

### Distribution of funding within research institutions

The Norwegian Crop Research Institute (NCRI) received the largest amount of funding during the period 1990-2004 (Figure 2) and it has also received the major part of the research funding for projects that were still running or granted in 2004 (Figure 3). The Norwegian Centre for Ecological Agriculture (NORSØK) and the University of Life Sciences (UMB) received funding that was roughly comparable with that of NCRI until 2003 (Figure 2). Thereafter, the funding to NCRI for OF&F projects has been much higher than for any other research institute.

The veterinary institutions (NVH in the first and NVI in the second period) and the Norwegian Agricultural Economics Research (NILF) have received some funding both before and after 2004. Other social science institutions, such as the National Institute for Consumer Research (SIFO), the Western Norway Research Institute (WNRI), the Centre for Rural Research (CRR) and the Norwegian Institute for Urban and Regional Research (NIBR), received funding for OF&F research during the period 1997-2003 only (Table 3, Food systems).

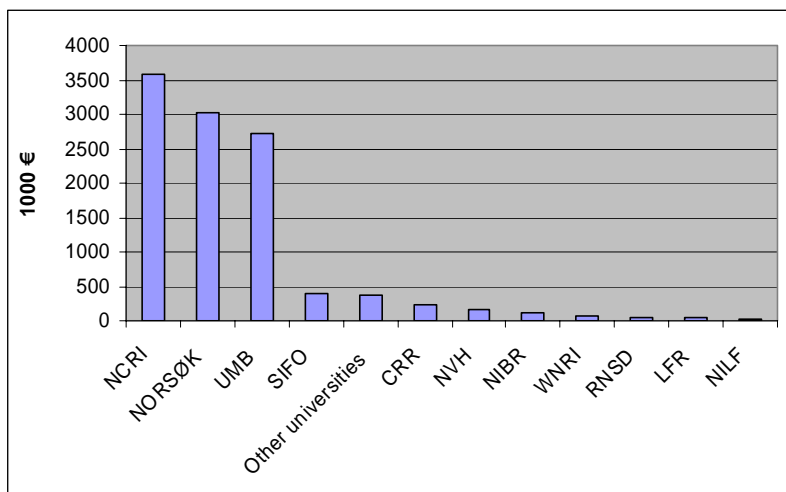


Figure 2. Distribution of the total project funding among research institutions during the period 1990-2003, for projects, which were completed by 2004. The acronyms are explained in tables 5 and 6.

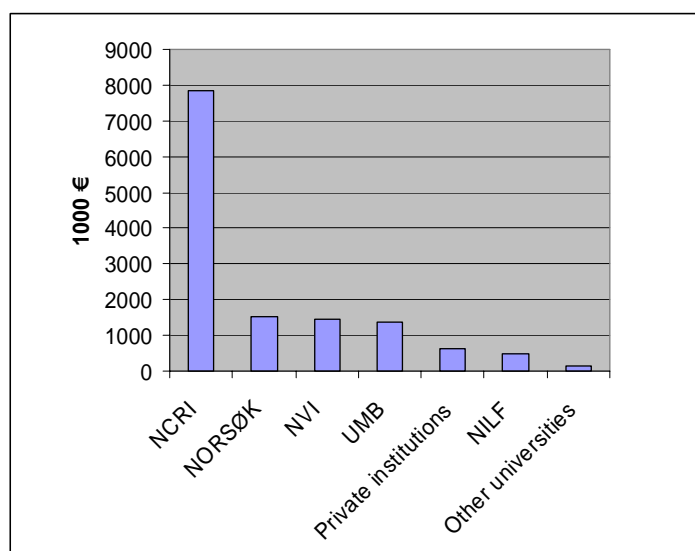


Figure 3. Distribution of the total project funding among research institutions, for projects, which were running or granted in 2004. The acronyms are explained in tables 5 and 6.

### Research 2006-2011

From 2006 and onwards, the main RCN programmes that will fund OF&F research are “Norwegian Food from Sea and Land” (2006-2011) and “Area and Nature-based Industrial Development” (2006-2011). Some funding may also come from other RCN programmes. The Food Research Programme focuses on the total food chain from fork to farm/fjord. Thematically, the Food Research Programme covers all kinds of food production, including seafood, but the first part of the value chain for aquacultured species is treated in another programme (Aquaculture). The Area Programme supports research that is required to utilise the land and coast based resources for economic purposes other than production of food or forest. It also concentrates on research about trade policy (WTO etc.) and scientific support to regional and national policies. Most projects that are funded within these programmes have to be partially funded by a commercial user (e.g. industry, farmers’ organisation etc). The annual economic funding for the Area Programme is approximately € 5 million, and for the Food Programme, € 16-20 million.

For the first call of these programmes (September 1, 2005) a total of 159 proposals were submitted; 89 to the Food Programme and 70 to the Area Programme. Total costs comprised almost € 24 million, whereas the available funds for new projects in 2006 were approx. € 5 million in the Food Programme and € 2.5 million in the Area Programme. In addition, € 2 million from AA- and Levy funding was coordinated with the Food Programme and € 0.75 million from AA-funding was coordinated with the Area Programme. AA-funding may be used as part funding from a private user in research projects of general interest, if a commercial user is difficult to find. More information about this is found in chapter 4.

An earmarking of funds for OF&F research has so far only been made for AA-funding, and comprises € 2 million for 2006. However, the RCN and the AA-funding board have recently decided to launch a joint targeted call for OF&F research proposals in April 2006.

## **4. Financing**

### **Three main funding bodies**

Significant research activity within OF&F has been partly financed by the basic funding of the research institutions, but this activity is not described below.

Three main funding bodies finance the research in OF&F described in this report:

- The Research Council of Norway (RCN)
- The Agricultural Agreement Research Fund (AA-funding), which is a research funding scheme established through an agreement between the farmers' organizations and the government
- The Foundation for Research Levy on Agricultural Products (Levy funding), which is created by a small tax on agricultural products

Below, the financing and management of these funding bodies is described.

### **RCN**

The programmes of the RCN have been described in chapter 3. The financial resources of the RCN are determined annually by the state budget. RCN receives its funding for food and farming research from the Ministry of Agriculture and Food (MAF) (Food- and Area Programmes), The Ministry of Fisheries and Coastal Affairs (Food- and Area Programmes), The Ministry of Trade and Industry (Food Programme), and the Ministry of Health and Care Services (Food Programme). Organic projects must compete with general agricultural research for funding. Research within food and farming is carried out in close cooperation with commercial or public users (e.g. industry, farmers' organisation etc).

### **AA-funding**

The Agricultural Agreement Research Fund (AA-funding) has been an important source of funding for many OF&F research projects. On average, AA-funding comprises approximately € 4.5 million per year in total. Annual negotiations between the government and the farmers' organisations settle the size of AA-funding and the amount allocated to OF&F research. Applied collective research on topics of importance for the agricultural sector is of special interest to AA-funding. Over the years, AA-funding has become closer coordinated with RCN funding. The two most important instruments of the RCN Food- and Area Programmes are "Knowledge-building Projects with User Involvement" (KIPs) and "User-led Innovation Projects" (UIPs). For these instruments, at least 20 % (KIPs) or 50 % (UIPs) of the budget must be co-funded by private users. In projects of general interest to all farmers, AA-funding (occasionally also Levy funding in KIPs) may be used to

cover the private contribution. The secretariat for the board of the AA-funding is with the Norwegian Agricultural Authority (SLF).

### Levy funding

The Foundation for Research Levy on Agricultural Products (Levy funding) comprises approximately € 11 million per year. 0.3 % of the value of all national and imported agricultural products is paid as a levy to this fund, to ensure significant research within the agricultural sector. Agricultural products are defined as all products that are processed in some way to become food articles or natural stimulants. For processed imported products, the levy is 0.2 %. The distribution of funds for research projects shall approximately reflect the economical importance of the respective products. As mentioned for AA-funding, the Levy funding is closely coordinated with RCN agricultural programmes. For the first time in 2004, some Levy funding was used for OF&F research.

## 5. Research facilities

### Background

In general, “organic” and “conventional” researchers in Norway cooperate well, which reduces the need for separate organic research facilities. There is also close cooperation between scientists and private farmers. An especially interesting example of such cooperation is located on one of the world’s oldest biodynamic farms (converted in 1932) in Norway, which has been used as an object for several scientific studies. Some other long-term organic farmers, especially within the biodynamic sector, are also open to researchers and offer their farm as a study area. Still, organically managed research fields and herds are required. Especially within Bioforsk a range of such facilities are available, as almost all divisions and departments have some organically managed land (table 7). The future existence of research fields and other facilities is dependent on funding and the long-term availability of the research facilities described below is somewhat uncertain.

### Experimental fields (organically managed)

Table 7. Area and year of conversion (YOC) available for OF&F research in Norway. YOC is defined as the year of conversion of the first fields on each location.

<b>Institution, location</b>	<b>Area (ha)</b>	<b>YOC</b>	<b>Main crops</b>
Bioforsk, Landvik*	3	1993	Vegetab.,seed
Bioforsk, Særheim	4	1998	Ley
Bioforsk, Kise	1.8	1998	Ley
Bioforsk, Apelsvoll**	12.4	1989	Cereals
Bioforsk, Løken	1	1991	Ley
Bioforsk, Sæter	1	1997	Ley
Bioforsk, Ullensvang	0.2	2000	Fruit: Plums
Bioforsk, Njøs	0.7	2000	Fruit, berries
Bioforsk, Kvithamar	4.3	1993	Cereals
Bioforsk, Tjøtta	10.2	1992	Ley
Bioforsk, Vågønes	106	2003	Ley



Bioforsk, Holt	4	1998	Ley
Bioforsk, Tingvoll	22	1986	Ley
Norwegian University of Life Sciences, Ås	15	1992	Ley, cereals
Hedmark University College, Hamar	16	1998	Cereals

\*) The fields at Bioforsk, Landvik comprise 1 ha silty loam, YOC 1993, used for a crop rotation experiment in vegetables 2000-2006; 1 ha silty loam, YOC 1999, used for experiments with cereals and grass seed; 0.5 ha sandy soil, YOC 1999, used for grass seed and vegetables experiments and 0.9 ha sandy soil, YOC 2005, used for grass and clover seed experiments.

\*\*\*) The fields at Bioforsk, Apelsvoll comprise 1.44 ha in the farming systems comparison experiment, YOC 1989 (see below); 1.5 ha managed as a diversified livestock system, YOC 1995; 2 ha for organic cereals, YOC 1997 and 7.5 ha for potatoes and cereals, rented land at Hoff, YOC 2000. All is morainic soil.

## Long-term experiments

### Farming systems comparison study, Bioforsk Arable Crops Division, Apelsvoll

A long-term farming systems comparison study was initiated at Bioforsk Arable Crops Division, Apelsvoll, in 1989. The aim was to compare on a model farm, level differences in yields, nutrient runoff, nutrient balances and economical results for conventional, integrated and organic dairy and cash crop farming systems. The vision of the project was to develop farming systems that minimise the runoff of nutrients and pesticide residues, produce healthy crops with optimal nutritional value and give satisfying yields and economic results. In 2000, the system was changed so that the term “integrated” was replaced by “optimal”, defined as the treatment that achieves the maximum yield per kilo leached nitrogen. The study comprises a field lysimeter with 12 plots, each 0.18 ha. Each plot is treated as a model farm, and six different farming systems (2 replicates per system) are compared as follows:

1. A reference cash crop farm with cereals and potatoes, managed as in the reference year of 1985
2. Optimal cash crop
3. Organic cash crop with 25 % land as green manure
4. Optimal cash crop with animal manure and 50 % ley
5. Organic mixed crop with 50 % ley
6. Organic mixed crop with 75 % ley

All model farms are managed with a 4-year crop rotation, where all crops are grown in each year (all plots are divided in four sub-plots).

### Long-term study of cropping system for organic dairy farming, Bioforsk Grassland and Landscape Division, Kvithamar

Since 1993, 1 ha farmland has been managed as an organic dairy production unit, with purchased farmyard manure (FYM; dairy cow slurry). The crop rotation is designed for a herd size of one animal unit ha<sup>-1</sup>, and the corresponding amount of manure is used in the experiment. The land is divided in four plots, which are tilled by normal size farm equipment in a four-year crop rotation comprised of 1) barley with undersown grass-clover ley, 2) and 3) ley and 4) mixed oats and peas. Yield levels and the nutrient content of soil and FYM are recorded regularly, and the earthworm population was studied in 1993, 1996 and 2000. As the soil here is heavy clay and conversion to organic farming practice caused a significant yield depression for several years, the experiment represents a nice example of development in yield levels after conversion.

### **Long-term study of organic stockless cash cropping system for organic vegetable production, Bioforsk Arable Crops Division, Landvik**

Since 1993, one ha farmland has been used for a study of yield levels and agronomy in a stockless organic system with grass and clover seed production and vegetable growing. The nutrient supply has come from composted household waste and compost made from the plant residues produced in the experiment. The crop rotation has been wheat undersown with grass-clover ley, two years grass-clover ley for seed production and three years of cash-crops (potatoes, cabbage, lettuce, carrots). Yield levels and the nutrient content of soil are recorded regularly and the earthworm population was studied in 1993, 1996 and 2000. The experiment represents an interesting long-term series of yield records in a stockless cash crop system under Norwegian conditions.

### **Animal research facilities**

*Table 8. Organically managed herds on research farms. YOC is defined as the first year the herd was managed according to organic standards.*

<u>Institution, location</u>	<u>Type of herd</u>	<u>Feeding</u>	<u>YOC</u>	<u>Contact person</u>
Norwegian University of Life Sciences (UMB), Ås	18 dairy cows	Individual	1995	
Bioforsk, Tjøtta	70 adult sheep	Group	1997	

### **Organic dairy herd at Norwegian University of Life Sciences (UMB)**

Most organic dairy farmers in Norway have spring calving dairy cows and pasture based milk production, often due to the general poor quality of silage used for winter feeding. Hence, there is a need to increase the organic milk production in late autumn and winter. Recently, revised organic standards require that all feedstuffs to dairy cows should be organically produced, which also enhance the focus on improving the quality of on-farm produced roughages. The UMB has conducted the project “Milk production and quality and N use efficiency by dairy cows offered white or red clover silages”. White and red clover silages with and without concentrate supplementation are compared with respect to effects on milk production and quality, as well as N use efficiency. The experiment was carried out during the winter 2004/2005 and will be repeated in 2005/2006. In addition to DM intake and milk yield, the treatments effects on milk quality, including the content and composition of fatty acids and phyto-oestrogens, will be evaluated. The herd is otherwise managed according to organic standards.

A farm unit at UMB has been organically managed since 1991. The farm consists of 15 ha in rotation and six ha used for pasture and a dairy herd with 18 dairy cows (table 8). Due to a feeding experiment with dairy cows, the area and herd was temporarily expanded in 2002. The herd is kept in loose housing and fodder consumption is recorded continuously for each animal. The milk yield is recorded individually 14 times per week, and body weight is recorded at each milk yield.

### **Research farms**

Currently, there are no research farms under any institute in Norway, nor private farm with a long-term research contract. However, several OF&F projects have been carried out on farm level with short-term contracts (3-5 years).

## On-farm study

*Organic dairy farm, Bioforsk Organic Food and Farming Division, Tingvoll*

The farmland belonging to the Norwegian Centre for Ecological Agriculture (NORSØK), where Bioforsk Organic Food and Farming Division (BOFF) is located, is managed as a dairy farm with a herd of 13 dairy cows, 15 adult sheep and approx. 30 laying hens. 18 ha cultivated land and eight ha pastures have been organically managed since 1995, by tenants who own the livestock. Plots for research studies are rented from the tenants. For the commercial dairy farm, BOFF researchers conduct annual registrations of yields, in addition to regular soil sampling and estimation of nutrient budgets. A climatic logger station measures the local temperature and precipitation during the growing season. In total, this represents an interesting data material, where trends in productivity etc. are studied on a practical farm level.

## Networks

There are currently no research networks in Norway, where farmers are communicating and research is carried out on their farms, except trials managed by the Norwegian Agricultural Extension Service (LFR, see chapter 2). Such trials have not been treated as research in the context of this report.

LFR is a very central research disseminator with 83 regional extension groups covering all Norway, out of which 17 aim at organic agriculture.

## Leaching fields

In the farming system experiment at Apelsvoll described above, drainage and runoff is collected separately from each plot and analysed for N and P once every month. Runoff occurs only in months with heavy precipitation.

## List of contact addresses

For convenience, we have listed all institutions active in OF&F research or education that is described in this report in table 9.

*Table 9. Institutions active in research or education within Organic Food and Farming.*

<b>Name of institution, acronym</b>	<b>Address</b>	<b>Web-page</b>
Bioforsk Norwegian Institute of Agricultural and Environmental Research	Fr.A. Dahlsvei 20 N-1432 Ås	<a href="http://www.bioforsk.no">www.bioforsk.no</a>
Bioforsk Organic Food and Farming Division	Tingvoll gard N-6630 Tingvoll	<a href="http://www.bioforsk.no">www.bioforsk.no</a>
Norwegian University of Life Sciences (UMB)	P.O. box 5033 N-1432 Ås	<a href="http://www.umb.no">www.umb.no</a>
Hedmark University College (HIHM)	Lærerskolealleen 1 N-2418 Elverum	<a href="http://www.hihm.no">www.hihm.no</a>
National Veterinary Institute (NVI)	PO box 8156 Dep. N-0033 Oslo	<a href="http://www.vetinst.no">www.vetinst.no</a>
Norwegian School of Veterinary Science (NVH)	PO box 8146 Dep. N-0033 Oslo	<a href="http://www.veths.no">www.veths.no</a>
Norwegian Agricultural Economics Research Institute (NILF)	PO box 8024 Dep. N-0033 Oslo	<a href="http://www.nilf.no">www.nilf.no</a>

National Institute for Consumer Research (SIFO)	PO box 4682 Nydalen 0405 Oslo	www.sifo.no
Western Norway Research Institute (WNRI)	PO box 163, N-6851 Sogndal	www.vestlandsforskning.no
Centre for Rural Research	Universitetssenteret Dragvoll N-7491 Trondheim	www.bygdeforskning.no
Norwegian Agricultural Extension Service (LFR)	Fr. A. Dahls vei 20 N-1432 Ås	www.lfr.no
Norwegian National School for Organic Farming and Gardening (SJH)	Sogn Jord-og Hagebruksskule N-5745 Aurland	www.sogn-j-h.vgs.no

## 6. Initiation of research and stakeholder engagement

*(How are new research programmes initiated? Who are the stakeholders and how are they engaged? What are the tools used for exposing research needs of specific stakeholders and society in general? What are the national needs? National research strategies as optional enclosures)*

### Programme initiation, RCN

When the RCN launches a new programme, a thorough process is started to ensure that important stakeholders are involved. The view that research is an important means to achieve political goals pervades all strategies that are developed during such processes. Prior to the establishment of a programme, strategic discussions on future research visions and instruments are carried out between the RCN and Ministries, industry representatives, programme boards of ongoing programmes etc. Stakeholders of general food and farming research, as well as those with special interest and responsibility for OF&F, are involved (see below). In the establishment of the new Food and Area Programmes (see chapter 3), a large board of members were working for approximately half a year to produce the goals of the programmes. Later, a smaller programme board was independently selected for each programme to represent the various users of the results from the research activities, such as producers, the processing industry, distributors and the authorities (Attachment 1).

Stakeholders with special interests in OF&F research were also included in the process. An RCN appointed group proposed future priorities for OF&F research, as presented in a report of October 2004, in Norwegian<sup>3</sup>. The report may be found in Organic Eprints. The advisory group was composed of farmers, extension services, processing industry, distributors and research institutions (Attachment 1). A draft of the report was discussed in a meeting with a range of stakeholders from the OF&F sector and many important changes were introduced. A central term in the report is “the product circle”, implying that projects within OF&F research should focus on a broad part of the circle formed by production, processing, distribution, consumption and recycling back to the production field. Detailed priorities are given within four fields of research: external conditions such as public regulations and subsidies etc.; sustainability and ecosystem services; production and agronomy; as well as processing, distribution and the consumer. The report suggests an increased emphasis on social science.

<sup>3</sup> Prioriteringer av forskning på økologisk produksjon og omsetning. Rapport til Norges Forskningsråd avgitt 15.oktober 2004. (Priorities of research on organic production and distribution. Report to RCN, October 15, 2004). 28 p.

## Programme initiation, AA-funding and Levy funding

These funding bodies do not design research programmes, but develop their research priorities in close cooperation with producers and food and farming related industry. The funding board of the AA-funding is made up by representatives of the Farmers' Union, the Farmers' and Smallholders' Union and MAF (Attachment 1). For Levy funding, this board is extended with representatives from the food industry, distributors, food industry branch organisations and the labour union (Attachment 1). The RCN has an observatory status. Since the size of AA-funding is negotiated annually between MAF and the farmers' organisations, priorities for OF&F research are usually also established annually, whereas the aims of the Levy funding are more general (see chapter 4).

## National needs within OF&F

In this context, we have chosen to focus on the priorities expressed in the RCN Food- and Area Programmes and the most recent priorities from the AA- and Levy funding, which will be the main funding sources for OF&F research in near future.

## The Food Programme

RCN has for several years, as well as for the near future, decided to integrate OF&F research in the general agricultural research programmes. Hence, the priorities for the general agricultural research are essential also for OF&F research.

In general, various public funding mechanisms are gradually becoming more coordinated. Several instruments focus on the cooperation between sectors, such as the industry and research (R&D) providers. The vision of the Food Programme is **“Competitive and innovative industries that supply Norwegian food for the future”**. The value chain from consumer to primary production is a core wire in the programme, as is the aim to create synergies between research in the agricultural and sea food sectors. The green and blue sectors have previously been in separate programmes. It is an important objective for the programme to establish some user-led innovation projects and/or knowledge-building projects that cover the whole value chain from market to primary production and that cause a synergy between marine and agricultural food production. Important principle themes in the new programme are: market research; innovative and market-adjusted products and entrepreneurship; production technology, process technology and logistics; competitive production of raw materials; food-related health quality and quality of life; innovation in public sector/food administration. Organic production is mentioned under the principle theme **“Competitive production of raw materials”**. Here, it is stated that **“in order to strengthen the competitiveness, knowledge is required about optimal production systems and types of operations, including organic production, that safeguard health and welfare in production and that ensure safe and reliable food production”**. Important interdisciplinary themes across the principal themes will be competitive raw materials and industrial production, innovative products and processes, as well as food and health. It is a challenge, not only for the OF&F research sector, but for the general agronomic research sector in Norway, to utilise the possibilities that the Food Programme represents and adapt their research strategies to these priorities.

The CORE Organic ERA-NET is described in the programme, and the Food Programme is responsible for the follow-up in this ERA-NET. It is stated that **“During the programme period (2006-2011), transnational calls for proposals for research in selected themes, where funds from the programme may be used, may be relevant.”**

More information is available in the programme plan, which can be found at

[http://www.forskningsradet.no/servlet/Satellite?blobcol=urlvedleggfil&blobheader=application%2Fpdf&blobkey=id&blobtable=Vedlegg&blobwhere=1119339842529&cachecontrol=5%3A0%3A0+%2F%2F\\*&ssbinary=true](http://www.forskningsradet.no/servlet/Satellite?blobcol=urlvedleggfil&blobheader=application%2Fpdf&blobkey=id&blobtable=Vedlegg&blobwhere=1119339842529&cachecontrol=5%3A0%3A0+%2F%2F*&ssbinary=true)

The annual economic funding for the Food Programme will be approximately € 16-20 million from 2006-2011.

## The Area Programme

The Programme may be seen as a partner to the larger Food Programme, and the focus here is on non-food, non-timber and area-based productions. The main users of results from the research activities in this Programme are trade, industries and public authorities in fisheries and aquaculture, agriculture, reindeer breeding, forestry, tourism and travel. The vision is **“Increased wealth creation in the area-based and nature-based industries”**. Two principle target areas of the Programme are 1) “Area resources, innovation and industrial development” and 2) “Industrial policy and public administration”. Research priorities in target area 1) are: areas and landscapes as a commercial and industrial basis; innovation and industrial development; market research; organisation, and competence and management. Research priorities in target area 2) are: industrial policy in agriculture, reindeer breeding, fisheries and aquaculture; international framework conditions; area and environmental management; changes in the public sector. Organic farming is not explicitly discussed in the Programme, but it is targeted within the research topics. Of importance for OF&F in this Programme is the principle of sustainable management of natural resources, the focus on the value chain in area-based productions, the focus on topics related to social science and market studies, as well as scientific support to policy development within aqua- and agriculture and other area-based trades.

More information is available in the programme plan, which can be found at <http://www.forskningsradet.no/servlet/BlobServer?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=Vedlegg&blobwhere=1119339842829>

The annual economic funding for the Area programme will be approximately € 5 million from 2006-2011.

## AA- and Levy funding priorities

These bodies have a common list of prioritised goals:

1. Exploit Norwegian natural resources for animal husbandry and crop production
2. Value creation in food production – new products or products with increased quality, demanded by the industry or consumers
3. Increased efficiency of agriculture, production methods, equipment, machinery, housing, etc.
4. Sustainable development and confidence in Norwegian food, food safety, animal welfare, environment, nutrition and health.

In 2006, the most central priorities are food safety, -quality and health, especially linked to bio-hazards, product innovation, cost reduction and animal welfare. For organic farming in particular, research that may support an increased demand for organic products is important. Furthermore, documentation of the effects of organic farming on society will be prioritised.

## 7. Selection criteria and evaluation procedures

The evaluation and selection process for project proposals is comparable for all three funding bodies, but different instruments are evaluated according to different assessment criteria. All researcher proposals are evaluated by two independent referees on the basis of the following criteria (score 1-7, with personal comments): national priorities, scientific quality, relevance for the food industry, ongoing “world class” research/ skill of contractor, relevance according to the call, the realism of the research, the chances of achieving the objectives, value for money/ the cost of the

work, enhancing collaborative research, potential to be included in EU's Framework Programmes, and international networking. The evaluation criteria for Knowledgebuilding Projects with user involvement (KIPs) and User-led Innovation Projects (UIPs) are different and to some extent more restricted. KIP-criteria are as follows: general project quality; research content; scientific merit; international collaboration; commercial relevance; relevance to enabling technologies; the environment, ethics and equal opportunity; relevance relative to the call for proposals. For UIPs the following applies: general project quality; degree of innovation; research content; international cooperation; economic value; socio-economic utility value; risk; additionality; the environment, ethics and equal opportunity; relevance relative to the call for proposals. The three funding bodies emphasise that all research shall be of ethically high standard, environmentally sustainable and bear no offence with respect to gender equality. There is no system to ensure that proposed OF&F research projects are based on research methods specially designed for this farming system.

Because of the evaluation procedures and to emphasise the significance of international cooperation, all researcher project proposals and KIPs are written in English. UIP-proposals are in most cases evaluated by a panel of experts and may therefore be written in Norwegian. Based on the referee reports/panel discussions and considerations of which projects best fit the general aims of the RCN programme, the general and annual aims of the AA-funding and the general aims of the Levy funding, the programme or funding boards (see chapter 6) select projects for funding. The applicants receive a copy of the evaluation from the experts or panel along with the conclusions of the evaluation process from the Programme Committee (PC).

The proposal cannot be modified before the final decision of the Programme Committee/funding board. However, the PC may suggest modifications and provide funding, based on recommendations from the evaluators. Hence, proposals may be modified during contract negotiations.

The selected project proposals may be subjected to a minimum of contract negotiations before a contract is signed. Granted projects (Researcher and KIPs) provide an annual report of progress to the RCN, in which considerable deviations from the proposed project plan have to be explained. The report of progress has to be accepted before next year's budget is granted. Completed projects provide a final report. UIPs provide bi-annual reports (the second of these with a financial report) and a final report (also with financial report). All reports have to be accepted by the RCN.

## **8. Utilisation of research**

### **Background**

Norwegian farmers are generally well educated and informed. However, an increasing number of farmers commit extra work outside the farm, which makes it a challenge to catch their attention. Traditionally, the extension service has been comprehensive in Norway. In addition to the Norwegian Agricultural Extension Service (LFR), the dairy, meat and poultry industry have their own advisers, who visit the farmers regularly to discuss the production records and management details. Within the LFR, a separate system of extension bodies for organic agriculture has been developed (see chapter 2), covering the whole country. Some organic extension bodies are organised as separate institutions, whereas others are integrated in the general extension bodies. There are separate journals, arrangements and web pages for Organic Food and Farming. In addition, general agricultural knowledge dissemination systems also include OF&F. In this report, only the systems that are dedicated to OF&F are described.

## Journals

Four Norwegian printed journals are entirely dedicated to OF&F. The journal “Økologisk landbruk”, until 1993 called “Hummelposten”, is published in cooperation by the network of organic extension groups within LFR. “Økologisk landbruk” means organic agriculture. The journal is published four times a year. The extension agents in LFR mostly write the papers, but the journal is also a common information channel for researchers.

The journal “Grobladet” (the Norwegian name of *Plantago major* L.) is published and produced by Oikos four times a year (see chapter 2). The target group is organic gardeners and producers of herbs, vegetables, fruit and berries. The journal is an information channel for researchers within OF&F.

Oikos also publishes the journal “Ren mat” (which means “pure food”), with six issues per year. This journal is meant for consumers and people generally interested in OF&F. The topics of the journal are sustainable food, environmental issues, politics etc. but not production oriented papers. Hence, “Ren mat” is not as important as a channel for research results as “Økologisk landbruk” and “Grobladet”.

The quarterly journal “Herba”, published by the biodynamic association (see chapter 2) welcomes research papers of interest for biodynamic food and farming.

The journal “Forskningsnytt om økologisk lantbruk i Norden” is a cooperation between the OF&F research institutes in Sweden, Denmark, Finland, Iceland and Norway. The journal is published four times a year, and each issue has a thematic focus (e.g. local processing, genetic engineering). Papers may be written in Danish, Swedish, Norwegian or English. This journal is an important channel of dissemination of research results and to strengthen the contact between OF&F researchers in these countries.

## Other written materials

In addition to papers in Norwegian and in international journals, the results of OF&F research are published in report series published by the most active research institutes (Bioforsk, HIHM). The proceedings of national seminars, as well as NJF seminars (see below) are important channels of information and are published in the report series of the responsible institution. Especially for farmers, Bioforsk Organic Food and Farming Division publish a series of leaflets on practical topics. There are technical books for agricultural colleges available on the conversion to organic agriculture, soil cultivation in organic agriculture and organic animal husbandry, where research results are described.

## Advisory service

*The Norwegian Agricultural Extension service, LFR (Landbrukets forsøksringer)*

As mentioned in chapter 2, the Norwegian Agricultural Extension Service (LFR) has 83 regional extension groups covering all Norway, out of which 17 aim at organic agriculture. Further information in English may be found at [www.lfr.no](http://www.lfr.no). In addition to the journal “Økologisk landbruk”, the extension agents provide consultancy to interested farmers during the conversion process and afterwards, especially linked to mandatory plans for fertilisation on farm and field level. Research results are an important basis for such advice. The extension groups also arrange seminars, where researchers are commonly invited to present and discuss their results. During the growing season, farmers are invited to field visits on interesting farms, or to observe interesting research plots. Research plots managed by the extension agents are partly designed by the extension groups to study questions of interest to local farmers and partly designed by research institutes who conduct series of field experiments in various regions of the country.



### **Advisers linked to industry**

Some of the advisers employed by the agricultural industry are very interested and well qualified in OF&F topics. Several courses have been held for the advisers especially in the largest dairy company, TINE. Such courses are an important channel of dissemination of OF&F research.

### **Meetings and conferences**

A national congress in organic farming was arranged in Hamar in the county of Hedmark in 2000, 2002 and 2003 by the Hedmark University College in cooperation with NORSØK (now Bioforsk) and Norwegian Agricultural Authority (SLF), who supported the arrangements. 200-250 people have participated in the arrangement, which was combined with an exhibition of technical equipment etc. The future of this congress is for the time being uncertain.

Each year, Bioforsk arranges a series of meetings in various parts of the country commonly called “Crop meetings”, where especially the Crop meeting for Eastern Norway usually has much focus and separate sessions for organic agriculture. More than 300 people usually participate in this meeting, mainly advisers, researchers, public officials and some farmers.

Bioforsk Organic Food and Farming Division arranges annually open days at the research farm in Tingvoll or elsewhere in the local area, to disseminate research results and knowledge about Organic Food and Farming, often in cooperation with the county agricultural authorities.

From 1982 to 2002 (except in 1995), a seminar called “Vossaseminaret” was arranged annually by a group of voluntarily people engaged in organic agriculture. Voss is located in the western part of Norway, close to Bergen. The tradition has been transformed to a new series of meetings arranged at the Norwegian National School for Organic Farming and Gardening, Sogn Jord-og Hagebruksskule (SJH), see below for details about the school. These seminars focus on ideology, science philosophy and global aspects of organic farming. At SJH, seminars have been arranged in 2003 and 2005, and a 3<sup>rd</sup> meeting is planned in 2007.

The Nordic Association of Agricultural Scientists (NJF) arranges interdisciplinary congresses for all members each fourth year, latest in Finland in 2003. On these congresses, the interest for Organic Food and Farming has been increasing and OF&F research receives much attention both in separate sessions and included in the general sessions. Further, NJF has arranged several interdisciplinary seminars on OF&F, the latest in 2005. The association has also arranged seminars on certain topics within organic agriculture, such as nutrient flows between agriculture and society. More information can be found at [www.njf.nu](http://www.njf.nu). The association works to increase the contact between researchers and advisers in agriculture in the Nordic and Baltic countries.

### **Web pages**

In addition to the information found on the web pages for the various research, extension and education institutions described in this report, the web page [www.agropub.no](http://www.agropub.no) contains a range of technical papers, as well as a news service about organic agriculture. Agropub is a cooperation between Bioforsk Organic Food and Farming Division and the publishing firm GAN.

## 9. Scientific education and research schools

### High school level

Several high schools offer education in organic agriculture, but only one high school is fully organic. This is the Norwegian National School for Organic Farming and Gardening, Sogn Jord-og Hagebruksskule (SJH), which offers two years theoretical and practical education in OF&F. A good description in English is given at <http://www.sogn-j-h.vgs.no>. At SJH, the curriculum is centred on ecological agriculture and sustainable community development. The school is owned by the county of Sogn and Fjordane, but is officially recognized as the National School for Ecological Agriculture. Many foreign students have attended SJH on the understanding that Norwegian is the language of instruction. The school farm is managed ecologically (certified organic) and SJH is the only agricultural school in Norway, where the students follow the practical work throughout the whole growing season. The students receive the degree *Agronomist in Ecological Agriculture*, and are supposed to have the basis for managing an ecological farm and the foundation for responsibly managing natural resources in an ecologically sound fashion.

### University level

Hedmark University College, Hamar offers a Bachelor study in “Organic Farming”. The study focuses on environmentally sound production of food, with the slogan “Clean food and a clean environment”. To refrain from agricultural chemical inputs is a challenge and more knowledge is required from the advisers as well as from the farmers. The study offers this kind of knowledge to both of these groups and the study is both theoretical and practical. The study may be prolonged to receive a Master degree at UMB (see below).

The Norwegian University of Life Sciences (UMB) offers an international two-year Master programme in “Agroecology”, through Nordic collaboration in AGROASIS - the Nordic School of Agro ecology/Ecological Agriculture. The primary responsibilities of the school are the development and content of a Nordic educational programme (MSc, PhD) and a Nordic research and development programme. AGROASIS is a NOVA University Network project between:

- Norwegian University of Life Sciences (UMB) - Norway
- The Royal Veterinary and Agricultural University (KVL) - Denmark
- The Swedish University of Agricultural Sciences (SLU) - Sweden
- University of Helsinki (HU) - Finland
- Agricultural College of Hvanneyri (LBH) - Iceland

UMB conducted three Nordic PhD-courses on research methods in agroecology/organic agriculture, in 1995, 1996 and 1997. Since then, Norwegian students have had the possibility to participate in Nordic PhD-courses in organic farming/agroecology in Sweden or Denmark.

## **Annex 1. Overview of institutions participating in funding boards or report committee**

*Table 1. Institutions in the Boards of Directors of the research programme “Area and Nature-based Industrial Development” and “Norwegian Food from Sea and Land”, managed by the Research Council of Norway.*

### **Area Programme**

Agricultural Authority of Hedmark County  
Norwegian Hospitality Association (RBL)  
Farmer  
Norwegian Seafood Federation (FHL)  
Innovation Norway  
Nordland county Fishermens’ Association  
NORSKOG, members’ association for forest owners  
Norwegian Farmers’ and Smallholders’ Union  
Norwegian Forest Owners’ Association

### **Food Programme**

Gilde Norsk Kjøtt BA, Norwegian farmers’ meat cooperative  
Gunnar Klo A/S, exporter of fish  
The Norwegian Association of Wholesale Grocers (NCF)  
Norwegian Food Safety Authority  
The Federation of Norwegian Agricultural Cooperatives  
Fisher  
Norgesmøllene A/S, cereal mills  
Innovation Norway  
Norwegian Seafood Export Council

*Table 2. Institutions in the Board of Directors for the Foundation for Research Levy on Agricultural Products and the Board of Directors for the Agricultural Agreement Research Fund (marked by \*).*

Ministry of Agriculture and Food\*  
The Norwegian Farmers’ Union\*  
The Norwegian Farmers’ and Smallholders’ Union\*  
Federation of Norwegian Food and Drink Industry  
The Norwegian Confederation of Trade Unions (LO)/  
The Norwegian Food and Allied Workers Union (NNN)  
Norwegian agricultural purchasing and marketing Co-Op  
BAMA (distributor of fresh food)  
Research Council of Norway, observatory status

*Table 3. Members of the group responsible for the report “Priorities for Research within Organic Production and Sales”, published in October 2004.*

<b>Person</b>	<b>Institution</b>
Anne Kathrine Fossum, head	Agricultural Authority of Hedmark County
Eivind Brendehaug	Western Norway Research Institute
Ragnar Eltun	Norwegian Crop Research Institute
Astrid Nilsson	Norwegian Food Research Institute
Per Christian Rålm	OIKOS (see chapter 2)
Carl-Erik Semb	Norwegian Agricultural Authorities
Jens Strøm	BAMA (distributor of fresh food)
Ketil Valde	Norwegian Centre for Ecological Agriculture