

COUNTRY REPORT ON THE STATE OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

DENMARK



Plant Genetic Resources for Food and Agriculture

**in Denmark
Second Danish National Report to FAO**

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Note by FAO

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LIST OF ACRONYMS

AEGIS	A European Genebank Integrated System
CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CGRFA	Commission on Genetic Resources for Food and Agriculture (of FAO)
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MFAF	Ministry of Food, Agriculture and Fisheries
MTA	Material Transfer Agreement
NAP	National Action Plan for Plant Genetic Resources for Food and Agriculture
NGB	Nordic Gene Bank (now: NordGen)
NordGen	Nordic Genetic Resources Centre
SMTA	Standard Material Transfer Agreement (of the ITPGRFA)

INTRODUCTION

This is the second Danish country report to FAO on the state of plant genetic resources for food and agriculture. FAO will use this report, together with other country reports, as a basis for the preparation of the 2. *State of the World's Plant Genetic Resources for Food and Agriculture*.

The report does not intend to give an in depth description of the state of PGRFA in Denmark, but to provide a short overview of the current situation, focusing on changes that have occurred since the first Danish country report was published. That report was made in June 1 995, prior to the International Technical Conference in Leipzig that led to the adoption of the *Global Plan of Action for plant genetic resources for food and agriculture* (Ministry of Agriculture and Fisheries, 1 995).

The country report is compiled by the Danish Plant Directorate, to a large extent using data from a recent publication made for the Ministry of Food, Agriculture and Fisheries (MFAF) by the University of Aarhus. This publication ("Plant Genetic Resources for Food and Agriculture in Denmark") was published in 2 007 and is only available in Danish. Nordic Genetic Resources Centre (NordGen) has provided input to the chapter on *ex situ* conservation.



THE STATE OF DIVERSITY



1.1 The state of diversity and the relative importance of all major and minor crops

The crops and the areas cultivated in Denmark during the period between 1 998 and 2 007 are presented in table 1.1. Denmark has conventional and organic growing systems. The area that was cultivated by organic farms in 2 008 amounted to approximately 172 000 ha which means that almost 7 % of Denmark's total area is cultivated organically.

Seeds of agricultural species marketed in Denmark should be officially certified. Varieties of such species must be included on the Danish or the European variety list to be approved for certification. Certified seeds are produced on contracts between seed production companies and farmers.

The most important crops are listed after the size of the cultivated areas, *i.e.* more than 10 000 hectare/year. These are wheat and barley followed by oat, triticale, and rye. Rape seed is also cultivated on large areas for food as well as bio energy for fuel. The main root crop used to be sugar beet for factories but potatoes are also among the major root crops. Potatoes are listed according to the size of the area they cover regarding their use for production of starch, human tuber consumption, and as seed potatoes. Denmark has large areas especially for production of grass seeds. The areas in cultivation with forage plants such as grasses, maize, legumes, and cereals are intensively cultivated with new and modern varieties. However, there are also forages with mainly grasses where the cultivation system is less intensive but in the group of the major crops. The obligatory set-aside land during this period has also been large.

TABLE 1.1

Crops and areas cultivated in Denmark during the period 1998-2007

Crop \ Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
AGRICULTURE										
>10.000 ha/year										
Wheat	673 209	619 381	619 160	632 705	575 749	663 610	665 869	678 735	692 337	691 670
Barley	659 836	701 188	731 088	737 307	818 635	705 237	693 337	702 845	688 398	626 232
Rape seed	111 879	139 810	99 125	78 608	83 758	106 343	121 626	113 412	124 469	179 842
Oat	28 614	25 784	44 448	59 498	54 725	49 064	54 588	58 261	60 288	55 563
Triticale <i>et al.</i>	29 153	52 216	54 546	41 948	36 130	36 735	40 414	42 518	42 036	41 646
Sugar beet	65 698	62 898	59 167	56 323	57 806	49 600	48 745	47 439	41 653	39 301
Potatoes	35 502	37 946	38 689	38 186	37 651	36 046	41 050	40 482	37 954	41 224
Rye	103 171	49 180	50 472	65 059	46 205	32 666	31 430	28 474	29 755	30 047
Seed production	84 515	80 979	78 949	84 958	71 040	87 193	90 781	96 122	103 941	87 262
Forage-Protein-Cereal mix (cultivation)	419 300	410 478	432 741	436 932	429 823	444 303	431 941	464 164	474 084	471 359
Forages (non-cultivation)	156 260	159 530	166 261	173 702	177 546	177 635	172 536	192 968	189 384	196 630
Set-aside land (grasses)	141 432	182 905	191 295	201 817	204 721	206 584	196 972	175 200	167 502	153 570

Crop \ Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	ha	ha	ha	ha	ha	ha	ha	ha	ha	ha
<10.000 ha/year										
Vegetables (field)	6 084	6 157	6 479	6 014	6 066	6 396	6 656	6 432	7 089	7 077
Pulses	106 051	65 762	35 590	31 964	40 184	31 356	26 593	15 819	11 353	5 639
Fodder beet	32 188	22 917	17 577	13 302	9 953	7 991	6 233	4 974	4 035	3 819
Peas (consumption)	3 962	4 172	4 149	3 441	2 689	3 386	2 979	2 999	2 841	2 741
Other industrial seeds	0	7	21	17	47	28	16	60	145	113
Linum	3 871	10698	5 029	1 422	221	117	113	98	212	59
Greenhouse	542	548	533	528	571	512	510	471	480	477
FRUIT										
Cherry	2 591	2 756	2 802	2 703	2 671	2 767	2 513	2 132	2 128	2 167
Apples	1 660	1 623	1 679	1 783	1 574	1 624	1 673	1 751	1 645	1 812
Pears	555	431	441	469	420	457	439	416	413	465
BERRY										
Black Currant	1 280	1 411	1 492	1 850	1 939	2 028	1 976	2 000	1 846	1 855
Strawberry	983	991	984	1 066	788	805	899	1 091	1 277	1 135
Other Fruit & Berry Sp.	435	472	612	576	584	648	756	848	774	887
Cultivated area in total	267 1 850	264 4 048	2 646 982	2 675 566	2 665 507	2 657 706	2 645 304	2 707 236	2 710 507	266 2 761

For the other crops the cultivated areas are less than 10 000 hectares/year. This does not necessarily mean that the actual species are of less importance. These areas include the vegetables cultivated in the fields and the peas used for human consumption. Fruit trees and berries presented in table 1.1 are also of great importance although the cultivation area falls within the limit for these species to be regarded as minor crops based on the area they cover.

Fodder beet is cultivated on smaller areas. The most important pulses are peas used for canned peas and other pulses including peas are grown to maturity. Around 7 000 hectares are cultivated with different species of vegetables such as cabbages, onions, carrots, and lettuce. The area with green houses is used for production of crops of tomatoes, cucumbers and sweet pepper.

Fruit trees and berries are important both in commercial production and for growing in home gardens. The areas presented in table 1.1 are for commercial production.

The state of diversity of wild plants for food production has been described in chapter 2 on the state of *in situ* management.

1.2 Crop varieties

In Denmark agriculture and horticulture are based on intensive methods for crop production. The species grown are used for producing seeds, food, feed, bio energy for fuel. With regard to the use of varieties the modern and newly bred varieties are applied by the farmers. The most recent developed varieties most often meet the needs for decline in use of fertilizers and agrichemicals such as treatments with herbicides and pesticides. This is to meet the demands for maintaining human and animal health through production of healthy food items for humans and fodder for animals, and to protect the environment. Furthermore, climatic changes are other challenging factors to obtain plants adapted and tolerant to shifting weather conditions.

Maximizing plant productivity by quantity has been an issue for the farmers for many years. However, the trend is now slightly changing to also concentrate on the direct benefit of the customers by improving quality of the plant products.

A direct effect of this is the growing market for organic products. However, this gives other challenges, *e.g.* with regard to the breeders for launching new varieties adapted to organic cultivation conditions as production and/or use of organic seeds and products must not be treated with synthetic agrichemicals.

Breeding of agricultural species such as cereals, grasses, rape seed and potatoes are maintained in the private sector whereas breeding of vegetables has dropped significantly and is almost non existing.

For development of new and adapted varieties which can meet the request for organic products and resist weather changes plant genetic resources conserved may be found valuable for our specific needs in the Nordic countries.

1.3 Main factors affecting the state of diversity

Policy at the European Union level is affecting the state of diversity in Denmark. The scale of production of the number and different species by the farmers is to a large extent guided by the membership of the European Union. As a consequence a number of the species cultivated are selected based on the subsidies to be obtained from the EU. Furthermore, in 1992 the European Commission adopted a compulsory set-aside rate meaning that it became obligatory to set-aside a percentage of arable land in each country. This was in order to qualify for area payments for arable crops under the reform of the common agricultural policy in the EU. The set-aside rate in 1999/2000 was 10%. However, the compulsory set-aside has been abolished from 2009 onwards because of the decline in global food production. The effect of the removal of the compulsory set-aside policy can already be measured in Denmark. The farmers have almost taken back in cultivation most of the former compulsory set-aside land. A continuation of this increase of cultivated land might continue. However, for some of the more specific vulnerable environmental areas this may mean loss of genetic diversity of grasses in such areas and thus have a negative effect on the environment.



THE STATE OF *IN SITU* CONSERVATION

The term “*in situ* conservation”, as defined by the International Treaty, includes two different concepts. One concept relates to the conservation of ecosystems and natural habitats where populations of wild PGRFAs are found. The other concept relates to the conservation of domesticated and cultivated PGRFAs in the surroundings where they have developed their distinctive properties, typically farmer’s fields. This latter concept is often termed “on-farm conservation”. However, the border line between conservation of wild and conservation of cultivated material is not always clear since many PGRFAs are neither cultivated nor truly wild, but occur as weeds in farmers fields. In this report we will, nevertheless, deal with these two types of conservation separately.

2.1 Registration of wild PGRFA

Danish wild PGRFA are a diverse group of species including i.a. wild or weedy relatives of cultivated plants, medicinal and aromatic plants, and wild plants that are collected and used for food purposes.

In an attempt to get a better overview of Danish wild PGRFA, the Ministry of Food, Agriculture and fisheries initiated a project to clarify i.a. which species are included and what their conservation status are. The same project also looked at *ex situ* conservation and Nordic cooperation and resulted in a report on the status and conservation of PGRFA in Denmark (MFAF and AU, 2007). The report of that project has been used extensively to make this country report.

According to the project report, wild PGRFA in Denmark includes some 449 species. This is roughly 1/5 of the approximately 2 500 species of higher plants found in the country.

A lot of information on the occurrence and status of conservation of these wild PGRFA can be found in e.g. floras and in list of species of particular areas, but data are typically scattered and diverse, and they often do not have the necessary level of detail. This is because monitoring of natural habitats and ecosystems are done by a lot of different authorities and stakeholders and for a lot of different purposes. Until now there has not been made any systematic attempt to get an overview of the occurrence and status of conservation of all wild PGRFA in Denmark.

The above mentioned Ministry of Food, Agriculture and Fisheries project has given a better overview of the current situation. It has also suggested which species should be prioritised for further analysis and for protective measures. This prioritisation was necessary given the large number of species involved. The prioritisation has been based on several criterias, including e.g. the perceived value for use of a particular species and its current distribution and occurrence – if a species is known to be very common all over the country, there is no need to make targeted measures to conserve this particular species.

As a result of this exercise, 100 species have been given high priority and have been preliminary selected for further analysis. This next phase will include more detailed studies of distribution and assessment of population sizes and structure of selected species. This is the subject of a new project, which is part of the National Action Plan for PGRFA 2008-10.

2.2 Conservation of wild PGRFA

There is extensive legislation on Nature conservation in DK, and numerous areas and natural habitats are thus protected in some form or another. The legislation on Nature conservation originates at both national and Community (i.e. EU) level and its national implementation is largely the responsibility of the Ministry of the Environment. Approximately 15.5% of the area of Denmark is protected in some form or another.

It has generally been assumed that habitat protection in its various forms also resulted in conservation of the country’s wild PGRFA, even though such protection rarely included specific measures dealing with this type of plants. One notable exception involves a few woody species of PGRFA (eg. *Malus*, *Sambucus*) that were included in a programme aimed specifically at the conservation of genetic resources of forest trees and for which conservation strategies has been developed.



NordGen and its predecessor NGB have from time to time collected wild material for *ex situ* conservation, but apart from that there have been few Nordic activities on wild PGRFA.

The previously mentioned Ministry of Food, Agriculture and Fisheries project, which is continued in the Action plan for PGRFA 2 008-10, should lead to the development of more targeted approaches to the conservation of wild, high priority species of PGRFA. The budget for the project is 1 million DKK/year.

Apart from establishing a better overview of the conservation status and the development of more specific measures directed at the conservation of wild PGRFA, there is also a need for clarification of their legal status, in particular regarding conditions for access and use.

2.3 On-farm conservation

Commercial Danish agriculture is based on the use of modern, high yielding varieties, not on landraces or other types of old varieties. On-farm conservation of old varieties is therefore limited to some open air museums that grow and use crop plants as part of their public exhibitions, and to some NGO's such as the Danish Seed Savers Organisation, hobby gardeners and farmers that grow and use such material in their household.

In order to stimulate conservation and use of PGRFA and to increase public awareness of these resources, Ministry of Food, Agriculture and Fisheries has recently made a programme that gives economic support to such activities (cf. chapter 5). The programme is made within the framework of the Community legislation on rural development (Council Regulation 1698/2005).

The first call of proposal in 2006 resulted in a total of 13 projects being selected for support. A total of approximately 8 million DKK is distributed to the projects over a three year period.

Several of these projects involve some form of "on-farm conservation" although rarely in the text book meaning of the concept. This is because projects rarely involve farms in the narrow sense of the term, but rather farm museums, nurseries or public institutions. Furthermore, the conservation aspects are just one element, and not always the most important element, of many projects. Evaluation of the potential for use of the PGRFA as food or in environmentally friendlier agriculture, as well as demonstration of the plants for the public, are important parts of all projects. "Use it to conserve it" is the philosophy guiding many of the projects.

The second call for proposals in 2008 resulted in 8 projects being accepted for support. A total of approx. 4 million DKK were granted to these projects. A new call has recently been issued.

The projects initiated under the support programme for PGRFA are still running, and the programme has not yet been evaluated. But it can already be seen that the projects have managed to extend conservation of PGRFA to other localities than gene banks and university collections. And many people outside the traditional genebank community have become involved in conservation and use of PGRFA.

On-farm conservation in the European Region and its Member States is very much affected by Community legislation. Until very recently, Community legislation only allowed for the marketing of modern varieties, which obviously posed a big limitation for on-farm conservation of landraces and similar types of PGRFA. This situation is now changing.

As described in chapter 5, Community legislation allowing for the marketing of "conservation varieties" of agricultural crops was recently adopted and will be implemented in Member States, including Denmark, in 2 009. Legislation on amateur- and conservation varieties of vegetable crops is in the pipeline.

The changes in the legal basis for on-farm conservation coincides with an increased interest in old varieties among various stakeholders, particularly organic farmers and others who believe such varieties could have a potential for the production of high quality food. Advocates for a more environmentally friendly type of agriculture are also turning their eyes to old varieties and landraces. Hopefully, this will all lead to increased use of landraces and other types of old varieties in small scale production.

The borderline between on-farm conservation and use is, as mentioned above, not always clear. Some of the more use-oriented activities are described in chapter 4.

THE STATE OF *EX SITU* MANAGEMENT

The five Nordic countries, Denmark, Finland, Iceland, Norway and Sweden founded a joint Nordic gene bank in 1979. This is continued within the Nordic Genetic Resource Centre (NordGen, former called the Nordic Gene Bank). According to the agreement the countries have a joint ownership to the stored material.

3.1 *Ex situ* seed collections

The Nordic Genetic Resources Center (NordGen) is responsible for maintaining the seed collections of the Nordic countries. NordGen has accepted the mandate for safe long-term conservation and documentation of material of Nordic origin. However, long-term responsibility has also been accepted for a number of Non-Nordic accessions that cannot be repatriated to genebanks in the country of origin. Furthermore, NordGen also takes a medium-term responsibility for such material which has been identified as being duplicates of Nordic material as well as material which cannot be regenerated, e.g. F1 hybrids, or such material of Non-Nordic origin which might be repatriated to the country of origin in the future.

The information presented in the table 3.1 and 3.2 is on the material stored *ex situ* in the collections of NordGen. It contains figures from all the Nordic countries and has been presented in the respective reports of these countries as well. The "Ordinary Collection" is composed of material obtained through collections, donations and activities of the staff and the Nordic crop working groups. The "Special Collections" are donations from specific research and breeding activities.

TABLE 3.1

Nordic *ex situ* seed collections with number of accessions in long term storage, grouped by Nordic country of origin. The OTH column contains accessions from Non-Nordic countries as well as accessions of unknown origin.

Long term	DNK	FIN	ISL	NOR	SWE	OTH	TOT
Ordinary Seed Collection	1 520	1 152	300	1 512	2 465	447	7 396
Barley Mutant Collection	24				1 684		1 708
Barley Translocation Lines						685	685
Barley Duplication Lines						58	58
Collection of Wild <i>Triticaceae</i>	5	14	8	6	12	1 174	1 219
The Åberg collection (rye)						53	53
Inbred Rye Collection						126	126
Collection of Near-Isogenic Lines	5				390	135	530
Pisum Genetic Stock	25	45			831	748	1 649
The Haslund-Christensen Expedition to Central Asia						111	111
Total	1 579	1 211	308	1 518	5 382	3 537	13 535

TABLE 3.2

Nordic *ex situ* seed collections with number of accessions in medium term storage, grouped by Nordic country of origin. The OTH column contains accessions from non-Nordic countries as well as accessions of unknown origin.

Medium term	DNK	FIN	ISL	NOR	SWE	OTH	TOT
Ordinary Seed Collection	1 740	354	22	93	1 062	1 782	5 053
Barley Mutant Collection	370				7 880		8 250
Collection of Wild Triticeae						1	1
Pisum Genetic Stock					84	820	904
The Haslund-Christensen Expedition to Central Asia						4	4
Total	2 110	354	22	93	9 026	2 607	14212

Seed material of Danish origin stored in the "Ordinary Collection" of NordGen, is described in the table 3.3. Material of Danish origin for which NordGen has accepted the long term responsibility to preserve is presented as well as the material for medium term conservation and such material pending for a decision to be taken for the future conservation responsibility.

TABLE 3.3

Danish material in NordGen's "Ordinary Collection". The overview is divided into crop working groups and conservation responsibility.

Working group	Accepted*	Pending*	Temporary*	Total
Cereals	364	374	467	1 205
Fruit & Berries	13	0	0	13
Potatoes	9	4	0	13
Fodder plants	554	16	17	587
Vegetables	606	17	498	1 121
Root crops et al.	132	9	705	846
Industrial crops	0	18	0	18

Date 24 February 2 009

(*) Accepted: accessions accepted for long-term conservation

(*) Pending: accessions for which the future conservation responsibility has not yet been decided

(*) Temporary: accessions are kept only in the medium-term storage and will not be maintained. These are duplicates and F1 hybrids etc.

3.2 *Ex situ* vegetative field collections

The vegetative collections of fruit and berries are maintained at the University of Copenhagen, Life Science and the vegetables are maintained at the University at Aarhus in Årsløv. These institutions have been imposed to reporting every three year starting from 2 009 on the state of the actual vegetative collections. This means that an inventory will soon be available for these collections. Then more concentrated efforts can be made towards maintaining the accessions, *i.e.* varieties of Danish origin under long term conditions.

The responsibility for conservation and maintenance of the vegetatively propagated species of Danish origin is a task for the national programme. The collections are maintained within public institutions in field gene banks. The institutions maintain the relevant scientific expertise to evaluate the requirements for securing conservation of these collections. However, there is a need for an inventory to clarify which of the accessions in the collections are of Danish origin for which Denmark has the mandate for future long-term conservation responsibility. Furthermore, there is a need to make an inventory on such varieties of Danish origin which have earlier been cultivated but now lost in Denmark. It might still be possible to repatriate lost material of Danish origin from other countries.



A comprehensive and important collection of varieties of fruit species are maintained at the University of Copenhagen, Life Science in a place called Pometet. The accessions were collected during the 1940's and 1950's and these were planted at Pometet in 1956 and since then other accessions have been planted and included in the collection. Today this collection is also part of the fruit collections of NordGen. The collection is composed of varieties of Danish origin and also varieties of Non-Danish origin which have been of great value and have had a long cultivation history in Denmark. It has not been clarified whether accessions of Non-Nordic origin are conserved in their respective countries of origin. The accessions maintained in the collection at Pometet are shown in the table 3.4. However, during the years both single plants and even collections have been lost due to diseases.

TABLE 3.4
Accessions of fruit and berries maintained in the field gene bank called Pometet

Common name	Species	No. of accessions	No. of acc. with Danish origin	Mandate	No. of acc. safety duplicated
Apple	<i>Malus domestica</i>	app. 750	app. 270	app. 550	app. 410*
Pear	<i>Pyrus communis</i>	140	12	app. 100	70*
Plum	<i>Prunus domestica</i>	110	app. 15	app. 75	25*
Cherry	<i>Prunus avium</i>	app. 40	app. 8	app. 20	
Sour cherry	<i>Prunus cerasus</i>	app. 40	app. 20	app. 25	
Red currant	<i>Ribes rubrum</i>	51	app. 5	app. 40	40*
Black currant	<i>Ribes nigrum</i>	8	-	-	
Gooseberry	<i>Ribes uva-crispa</i>	135	20	100	60*
Strawberry	<i>Fragaria x ananassa</i>	220	34	app. 140	-
Raspberry	<i>Rubus idaeus</i>	21	1	Not clarified	-
Elderberry	<i>Sambucus nigra</i>	66	app. 60	66	-
Medlar	<i>Mespilus germanica</i>	9	Not clarified	9	-
Siberian crab apple	<i>Malus baccata</i>	8	8	8	-
Malus spp.	<i>Malus domestica</i> ssp	34	Not clarified	Not clarified	
Ciderapples	<i>Malus domestica</i>	26	-	2	-
Hazel, filbert, cob	<i>Corylus avellana</i>	33	Not clarified	Not clarified	
Walnut	<i>Juglans regia</i>	53	29	47	*
Grape	<i>Vitis</i>	ca. 80		app. 2	-
Blueberry	<i>Vaccinium</i>	2**	2	2	
Mulberry	<i>Morus nigra</i>	-			
Bullace, damson	<i>Prunus domestica</i> ssp. <i>Insititia</i>	2	2	2	
Total				app. 1 200	

*Project ongoing.

** New establishment of planting of varieties of old and earlier cultivated varieties. The varieties are of international origin.

The vegetatively propagated vegetables are such species that cannot be seed propagated. Collections of vegetatively propagated vegetables are maintained at Årslev.

The collections originate from former breeding activities going on to around 1990. The rhubarb collection was collected in the 1930's and part of the collection of horseradish was collected during the period between 1957-1964. The collection of *Helianthus* is composed of accessions from within and outside Denmark. In 2001 shallot onions were collected all around Denmark. In 2002 a collection of *Humulus* has been included as part of an ongoing research work.

TABLE 3.5

Collections of vegetatively propagated vegetables at the University at Aarhus placed at Årslev

Common name	Species	No. of accessions	No. of acc. with Danish origin	Conservation mandate
Horseradish	<i>Armoracia rusticana</i>	58	44	
Hop	<i>Humulus lupulus</i>	17	16	
Rhubarb	<i>Rheum x hybridum</i>	78	32	
Jerusalem artichoke	<i>Helianthus tuberosus</i>	17	5	
Shallot	<i>Allium cepa</i> var. <i>ascalonicum</i>	26	26	

3.3 *In vitro* collections

Potato and onions are maintained in *in vitro* collections. Table 3.6 is taken from the report from Finland. The collections are managed by NordGen.

TABLE 3.6

Nordic potato and onion accessions in *in vitro* storage

<i>In vitro</i> collection	DNK	FIN	ISL	NOR	SWE	TOT
Potato <i>In vitro</i> Collection	9	9	3	16	27	64
Onion <i>In vitro</i> Collection	15	24		8	18	65
Total	24	33	3	24	45	109

3.4 Storage facilities

NordGen conserves the seed propagated crops of agricultural and horticultural crops and also the Nordic potato variety collection.

NordGen is dealing with three different types of collections for storage. These are the Active- the Base and the Safety Base Collection. The seed material is dried and packed in hermetically sealed aluminium bags to avoid water uptake when stored in ordinary household freezers. The Active collection is stored at NordGen in Alnarp, Sweden, and in the Base collection, which was moved in 2 006 to Årslev in Denmark for security reasons. Furthermore, a Safety Base collection of the Base seed collection is stored on Svalbard in the Svalbard Global Seed Vault.

Seed material for which NordGen has taken either long- or medium term storage responsibility is stored under identical conditions in the seed store. The seed store fulfils gene bank standards for long-term storage. Thus the terms of medium- and long-term storage only refers to the responsibility to monitor and regenerate accessions rather than to the actual storage conditions. The terms accepted (ACC) and temporary (TEM) are more commonly used to denote material with long-term and medium-term responsibility, respectively.

Another difference between accepted and temporary accessions is the type of collections they are stored in. The accepted material is stored both in the Active as well as in the Base collection while the temporary material is only stored in the Active collection. The Active collection is used for distribution, characterization/evaluation and regeneration, *i.e.* multiplication. Multiplication should be made when the seed quantity in the Active collection has dropped to an insufficient. The Base collection is assumed to contain at least a certain minimum amount with minimum germination capacity of the most original seed samples. This material is set aside for the future and should only be used for rejuvenation in case the quality, such as seed germination has dropped to a critical low level for the species in question during regularly monitoring.



3.5 Security of stored material

The seed propagated material has since 1984 been stored with a duplicate of the Base collection, called the Safety Base Collection in an old coal mine on the Svalbard Islands. By now the Safety Base Collection has been moved to the Svalbard Global Seed Vault.

The vegetatively propagated collections maintained in Denmark must also be maintained in geographic distant areas away from the original accessions to prevent loss of the material. Diseases and pests, as well as frost and wind may cause damage. To avoid loss of accessions securing of copies of the collections have now been initiated see table below. This is mainly performed on land belonging to agricultural museums. However, a permanent solution to the economic maintenance has not yet been solved for the future running of such safety copy collections.

TABLE 3.7

Vegetatively propagated species safety duplicated at agricultural museums

Common name	Host for security	Locality	No. of acc. with Danish origin	No. of acc. safety duplicated
Horseradish	The organic garden	Odder	44	10
Hop	The Danish Agricultural Museum	Auning	16	16
Rhubarb	The Danish Agricultural Museum	Auning	32	50
Jerusalem artichoke	The organic garden	Odder	5	17
Shallot			26	0

3.6 Documentation and characterization

NordGen stores the documentation related both to the seed and the vegetatively propagated plant genetic resources for the Nordic countries.

NordGen has developed a relational information system for the Nordic seed collections, SEed STORe (SESTO) management system. The data sets include accession passport data, seed store data, taxonomic references and checklists, cultivar information, material requests, distribution, characterization and evaluation results, among others.

The vegetatively propagated collection of fruit and berries has been morphologically described and the data has been transmitted to NordGen. However, an inventory of which accessions are of Danish, Nordic, and Non-Nordic origin is missing and the morphological data is therefore not accessible yet. Also an inventory on which varieties have been cultivated or have been of great value to Denmark is missing and so is passport data for the old collections.

The vegetative fruit and berries collection at Pometet has been registered in FAO's World Information and Early Warning System (WIEWS) on Plant Genetic Resources for Food and Agriculture (PGRFA) under the institution number DNK020.

The vegetable collections have been morphologically described with a status of the documentation as presented here:

TABLE 3.8

State of the Danish vegetative vegetable collections

Common name	Inventorying	Passport data	Morphological /molecular description	Evaluation for cultivation	Evaluation of other	Use
Rhubarb	No	No	Ongoing	Yes	Yes	Ongoing
Horseradish	No	No	Ongoing	Ongoing	Yes	Ongoing
Jerusalem artichoke	No	Partly	Yes	Yes	Ongoing	Yes
Shallot	No	Yes	Partly	No	No	No
Hop	No	Yes	No	Ongoing	Ongoing	Yes

All descriptions are stored in NordGen's documentation system.

An inventory for perennial vegetables cultivated in Denmark is missing. Passport data for the old collections are missing. For the seed propagated vegetables a retrospective inventory is missing.

The collections in Årslev have been registered in FAO's World Information and Early Warning System (WIEWS) on Plant Genetic Resources for Food and Agriculture (PGRFA) under the institution number DNK011.

3.7 Germplasm movement

In the table 3.9 is shown the distribution of seed material from NordGen with special attention to Denmark.

TABLE 3.9

Requests received for seed samples from NordGen and distribution of seed samples with regard to Denmark

Year	Total no. of request	No. requests from DNK	Total no. distributed acc.	No. distributed acc from DNK
2005	125	14	2 847	171
2006	129	22	2 198	327

Most of the requested material from Denmark in 2 005 and 2 006 had specific relation to a public financed project on conservation and use of plant genetic resources.

3.8 Roles of botanical gardens

In three different botanical gardens in Denmark collections are kept. These are:

- University of Copenhagen keeps 1 334 accessions of wild species with Danish origin (country of collection in BG-base).
- University of Aarhus keeps 1 250 accessions of wild species with Danish origin.
- The University of Copenhagen, Life Science, keeps 7 025 accessions of plants. This collections contains many ornamentals.

Furthermore, the Danish Forest and Nature Agency conserves plant genetic resources of trees and shrubs including species related to the crop plants and of interest for agriculture and horticulture. The species of interest are *Crataegus laevigata*, *Crataegus laevigata*, *Crataegus monogyna*, *Malus sylvestris*, *Prunus padus* ssp. *padus*, *Prunus spinosa*, *Rosa canina*, *Rosa rubiginosa* s. lat., *Sorbus aucuparia*, *Hippophaë rhamnoides*, *Rubus fruticosus*, *Ribes nigrum*, *Prunus avium*, *Corylus avellana*, *Ribes alpinum*, *Sambucus nigra*, *Pyrus communis*, and *Juglans Regina*.

3.9 Assessment of needs

Nordic cooperation in *ex situ* conservation can be regarded as being successful. However, further needs have been identified:

- Secure long-term conservation of the national field collections of accepted material of vegetatively propagated material of fruit, berries and vegetables.
- Secure safety base duplication of accepted material of all vegetatively propagated species.
- Collect passport data of origin of accessions and identify accessions for accepted long-term storage conservation of all vegetatively propagated species.
- Replace lost accessions, e.g. during repatriation.
- Collect data of earlier cultivated varieties and landraces of all species for agriculture and horticulture (inventory).
- Collect culture historic data.
- Conserve in NordGen.
- Collect data from research projects.
- General work on plant genetic resources with NordGen.
- Molecular investigations of accepted long-term conserved accessions.
- Cryopreservation method development for vegetatively propagated species.



THE STATE OF USE

4.1 The importance of utilization

It is commonly known that the geographical area covered by the Nordic Region of Europe is at the fringe of distribution of many plant species. Denmark is therefore dependent on plant genetic resources that are adapted to the local environmental conditions which are prevailing here.

4.2 Utilization of conserved plant genetic resources

Denmark has been nominated "The Organic Country of the year 2 009" at the global fair BioFach in Nürnberg, Germany. Organic agriculture is increasing in Denmark although the prices are higher for organic products compared to the conventional grown products and also despite the current economic crisis. This is based on the request from consumers for high quality food and thus to improve sensory and nutritional quality of the products. An increasing interest for the food from the Nordic kitchen is a reality. Initiatives such as "new Nordic food", regional food culture", "slow food", and "six pieces of fruit and/or vegetables daily" have become popular and especially old cultivars and landraces of Nordic origin are of interest for this purpose.

Material from the vegetatively propagated collection of fruit, berries and vegetables has been and is used for purposes of:

- Mutation breeding in apples.
- Development of varieties of sour cherries.
- Delivering of plant material for multiplication of such material which is no more not in the market.
- Breeding of elderberries.
- Research projects such as in cultivation, plant biochemistry, food research, plant pathology, and entomology.

Breeding of agricultural species such as cereals, grasses, rape seed and potatoes are maintained in the private sector whereas breeding of vegetables has dropped significantly and is almost non existing.

4.3 Utilization activities

In Denmark economic support has been given in 2 006 for demonstration projects on conservation and use of plant genetic resources for food and agriculture. The background for the project is described in chapter 2.3.

The purpose of the project was to use such varieties that are not in commercial use but are or will be accepted for long-term conservation in NordGen. Among the purposes of the project was:

- To secure conservation of vegetatively propagated accessions in duplicate collections.
- To identify old varieties suitable and adapted to local environmental friendly cultivation, e.g. to protect ground water.
- To evaluate food quality of the old varieties such as suitability for food, i.e. for cereals their baking quality, and taste of bread, for fruit, berries and vegetables their quality when raw and prepared.
- To increase diversity of cultivated crops.
- To promote public awareness about the value of plant genetic resources and the importance of their conservation and use.

The use of seed material conserved in NordGen has been described in chapter 3.7. Furthermore, the opening up for marketing of "conservation varieties" in the European region is expected to have impact on the future utilization activities.

Recently the European Commission adopted a Council Directive amending the seed marketing Directives to allow seed of "conservation varieties", *i.e.* traditional old varieties and landraces or species threatened by extinction to be excluded from the usual strict testing during the certification process before marketing. The Directive shall be implemented in June 2009 and will be evaluated by the end of 2011.

4.4 Assessment of needs to improve utilization

A proposal has been to fund research projects with information on cultural historic of the agricultural species. This should be to document the development of crops, their cultivation and use in Danish agriculture.

Further, development and support systems for cultivation and seed production of old varieties and landraces of cultural historic value is needed.



THE STATE OF NATIONAL PROGRAMMES, TRAINING NEEDS AND LEGISLATION

5.1 Administration

The Ministry of Food, Agriculture and Fisheries (MFAF) is national authority for plant genetic resources for food and agriculture in Denmark. Genetic resources of wild plants, including forest trees, are the responsibility of the Ministry of the Environment. The two Ministries coordinate their activities on genetic resources, particularly as regards wild PGRFA where there is an overlap of responsibilities.

Several institutions in Ministry of Food, Agriculture and Fisheries are involved in PGRFA related activities, but overall coordination of both plant and animal genetic resources has recently been assigned to one institution, The Danish Plant Directorate, which host the Centre of Genetic Resources for Food and Agriculture. There are several reasons for this restructuring, the most important being that it reflects a similar development at the Nordic level (NordGen), as described elsewhere in the report. It should furthermore improve national coordination in eg. FAO-related matters.

The Danish Plant Directorate is also secretariate for the National Advisory Board for Plant Genetic Resources for Food and Agriculture, where various stakeholder groups are represented.

All in all, administration of the PGRFA-area in Ministry of Food, Agriculture and Fisheries is accomplished with less than two full time positions.

5.2 National strategy and national action plans for PGRFA (NAPs)

On Ministry of Food, Agriculture and Fisheries's initiative, Danish activities on PGRFA were described and reviewed in a National Strategy for PGRFA published in 2004 (PD & DJF, 2004). Based on this and on the Global Plan of Action of FAO, Ministry of Food, Agriculture and Fisheries made a National Action Plan for PGRFA 2005-7 (MFAF, 2004).

This has been followed up by a new National Action Plan for PGRFA 2008-10 (MFAF, 2008).

The overall aims of the current National Action Plan are:

- To secure conservation of PGRFA,
- To strengthen sustainable utilisation of PGRFA,
- To increase awareness of PGRFA,
- To strengthen research and development.

Activities from this plan are described in more details elsewhere in this report.

The annual budget for implementation of elements of the current National Action Plan is 1.5 million DKK excluding administrative costs. In addition to this, money are also provided from other sources such as the programme supporting projects on conservation and use of PGRFA (see later).

5.3 Legislation

Legislation of relevance for PGRFA is to a large extent harmonised within the EU. There is Community legislation on:

- The marketing of seed and propagating material,
- Intellectual property rights,
- Nature conservation,
- Rural development,
- Conservation and use of genetic resources.



Of particular interest is the regulation on the marketing of conservation varieties of agricultural crops that was recently adopted at Community level (Commission Directive 2 008/62/EC).

Before this regulation entered into force, landraces and similar material could not be marketed in the EU, because Community regulation only allowed for the marketing of certified seeds of modern high-yielding varieties that complied with DUS-requirements (“distinctness, uniformity and stability”) and VCU-requirements (“value for cultivation and use”). Landraces and older varieties did not comply with these requirements and could therefore not be accepted on neither national nor Community variety lists. It was consequently illegal to market such material in EU and its Member States.

The new regulation on conservation varieties makes derogations from Community seed laws to allow for the marketing of i.a. landraces. The aims are to ensure on-farm conservation and sustainable use of landraces and varieties that are naturally adapted to local and regional conditions.

Similar derogations from community legislation is expected to be adopted in the near future covering vegetables and seed mixtures.

Member States, including Denmark, are now implementing the regulation on conservation varieties of agricultural crops in national law, a process which must be finished by 30th of June 2 009.

Council Regulation 1 467/1 994 established a Community programme on conservation, characterisation, collection and utilisation of genetic resources. This programme was continued through Council Regulation 870/2 004. The programme has given economic support to more than 20 projects on plant genetic resources, including some with Nordic participation.

EU regulations on rural development (Council Regulation 1 698/2 005/EC and Commission Regulation 1 974/2 006/EC) give particular attention to the conservation of genetic resources. Co-funding can be given to a whole range of activities relating to the conservation and use of such resources.

Based on this, DK has made a programme that gives economic support to PGRFA-related projects. The programme was initiated under the previous EU regulation on rural development (1 257/1 999/EC) and is now in its fourth year.

In its first three year period, the aims of the programme were:

- To establish new and expand existing safety collections of fruit- and berries and of vegetatively propagated vegetables,
- To evaluate the potential of old varieties in a more environmentally friendly type of agriculture,
- To evaluate the potential of old varieties as a basic for development of quality food products, particularly in local productions,
- Promote public awareness of PGRFA.

The programme was initially limited to a list of crop species mainly fruit- and berries, and cereals.

The second three-year period of the programme has recently started, with Government Notice no. 249 of 14 April 2 008 as its legal basis. The focus of the programme is on the potential uses of PGRFA in food production and in more environmentally friendly agriculture. An overall guiding principle for the programme is that use of plant genetic resources will promote their conservation.

The list of crops covered has been expanded to include more species, eg. seed propagated vegetables. More details on the use of the programme is presented in chapter 2.

5.4 Public awareness

In recent years there has been a growing interest in quality food made of local or regional ingredients. This has e.g. resulted in a huge increase in the number of local “micro-breweries” and in initiatives such as “New Nordic Food”, where gastronomic entrepreneurs try to create or reinvent “A Nordic Cuisine”. It has also led to an increased focus on old varieties and land races and other types of plant genetic resources. As a consequence of this, new types of potential users have turned their attention to the material conserved in the gene banks. This has brought in particular NordGen in contact with other type of users than the traditional recipients of genebank material that is plant breeders and scientists. These new “customers” often ask for other types of material and related information than the traditional users. NordGen is currently adapting to these changes by eg. modifying its information system, particularly the user interface.

There has also been an increased focus on the cultural history of PGRFA, and several museums have expanded their collections of living plants. These plants are used in various activities involving visitors to the museum: harvesting, baking, brewing etc. This bring many people in contact with PGRFA and is thus a very important way of increasing public awareness of these resources.

Building on the experience of these museums, Ministry of Food, Agriculture and Fisheries has, in collaboration with the Ministry of Culture, started a project with the aim of making educational material on PGRFA. The project is an element of NAP 2 008-10.

Ministry of Food, Agriculture and Fisheries is furthermore involved in arranging seminars on PGRFA and related matters. The latest example was a Nordic seminar that was arranged in cooperation with NGO's and which brought together stakeholders not only from the "genetic resource community", but also from museums, research institutions, food producers etc. This contact between different stakeholder groups was very successful and stimulating.

Increasing public awareness of PGRFA is in addition an important element in most of the projects in the previously mentioned programme supporting PGRFA related activities. Examples of such elements are exhibitions of conserved varieties, "hands-on" activities using PGRFA and the setting up of local networks and user groups.

THE STATE OF REGIONAL AND INTERNATIONAL COLLABORATION



In the field of plant genetic resources for food and agriculture, Denmark is involved in regional and international collaboration at several levels: Nordic, EU, European and international (UN, particularly FAO).

6.1 Nordic cooperation

The Nordic countries have a long tradition for cooperation on many topics, and this cooperation is particularly well developed in the field of genetic resources. There is formal and informal cooperation at both scientific-technical, administrative and political levels.

In 1979 the Nordic countries established a regional gene bank (Nordic Gene Bank, NGB) to conserve and document PGRFA of Nordic origin or importance. The mandate of the gene bank has recently (2008) been expanded to cover also genetic resources of animals and forest trees. The newly restructured institution is called Nordic Genetic Resources Centre, or NordGen for short. It is situated in Alnarp (Sweden) and Ås (Norway). The Base collection is at Årslev (Denmark) and the safety collection in Svalbard (Norway). NordGen employs people from all Nordic countries. Material in NordGen is under common Nordic management and in the public domain.

The genebank has previously organised a number of crop specific working groups to assist its work at the technical and scientific level. The mandate and modus operandi of these groups is under revision as a result of the establishment of NordGen.

Working groups have typically been composed of crop experts from each of the Nordic countries. They have provided the gene bank with valuable scientific and technical input and assistance, and they have also served the gene bank as an important link to national activities. In addition to the use of permanent working groups, temporary groups have also been used extensively to address specific questions on an *ad hoc* basis.

NordGen is overseen by a board with representatives from all Nordic countries. NordGen reports to the Nordic Council of Ministers, who takes decisions on economic and policy matters.

6.2 European regional cooperation

Denmark is a member of the European Cooperative Programme for Plant Genetic Resources, ECPGR. The aim of the programme is to facilitate conservation and use of PGRFA within Europe on a cooperative basis. More than 40 European countries is expected to participate in the newly started phase 8 of this programme, which runs from 2009-13.

The programme is organised in a number of networks, each consisting of one or more crop working groups or task forces. Each member country is allocated a country quota to cover participation in working group meetings.

Denmark is represented in several working groups by either a national representative or a representative from NordGen. NordGen coordinates Nordic participation in these groups, which typically deal with PGRFA related matters at the technical level.

ECPGR is overseen by a steering committee composed of representatives from each participating country. The steering committee also decides on more political issues and has recently paved the way for a more formalised cooperation between European gene banks, through the so called AEGIS project.

6.3 Cooperation within the European Union

Member States of the European Union cooperate closely in all policy areas and the field of PGRFA is no exception. A lot of legislation of relevance for PGRFA originates in the EU, of which Denmark is a member. Some of this legislation establish an overall framework for PGRFA related activities, like eg. legislation on the marketing of seed and propagation material, and legislation on plant breeder's rights. Other legislation is targeted more specifically at PGRFA, such as:

- Directive 62/2 008/EC on the marketing of conservation varieties of agricultural species,
- Council Regulation 1 467/1 994 and 870/2 004 supporting actions for the conservation etc. of genetic resources,
- Regulation 1 698/2 005 which support rural development in general, but has specific provisions for genetic resources.

The extensive legislation at Community level necessitates a high degree of coordination between EU Member States prior to international negotiations at eg. FAO. A permanent Commission working party has this as its primary task.

6.4 Consultative Group on International Agricultural Research (CGIAR)

Denmark contributes regularly to the work of the international agricultural research centres of the CGIAR, who runs some of the major gene banks of the world and use the conserved material to develop new varieties, particularly for developing countries.

6.5 Cooperation in the UN

The two most important international legal instruments relating to plant genetic resources for food and agriculture in the UN are the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). The CBD sets the overall legal framework for access to genetic resources and sharing the benefits of their use whereas the ITPGRFA exclusively deals with PGRFA, in harmony with the CBD. Both the convention and the treaty are legally binding for contracting parties.

Denmark has ratified the Convention in 1 993 and the treaty in 2 004 and are fully supportive of the provisions of both instruments. Denmark is also member of FAO's Commission on Genetic Resources for Food and Agriculture (CGRFA) which is host to a range of activities involving PGRFA and other genetic resources for food and agriculture.

6.6 Assessment of needs

- Activities at the regional level, particularly within the EU, to implement FAO-IT should be strengthened,
- EU should continue and expand supportive actions for the conservation and, particularly, utilisation of genetic resources as under regulation 1 467/1 994 and 870/2 004,
- Cooperation between EU and ECPGR should be strengthened,
- Community rules on conservation varieties belonging to other crops than agricultural species should be adapted soon.

ACCESS TO PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE, SHARING OF BENEFITS DERIVED FROM THEIR USE, AND FARMERS' RIGHTS



7.1 Access to plant genetic resources for food and agriculture and sharing of benefits from their use

As described earlier in the report, PGRFA are conserved and used in many ways in Denmark. PGRFAs can be found in public or private *ex situ* collections, growing as wild plants on public or private land or as modern varieties on farmers field, to illustrate just a few categories. PGRFAs are thus a complex entity and access conditions are equally complex. Different access conditions apply to different types of material.

Within the Ministry of Food, Agriculture and Fisheries, work on access to PGRFA has to a large extent been done in collaboration with the other Nordic countries. This work led to the adoption of a declaration on access and rights to genetic resources by the Nordic Council of Ministers (Kalmar declaration, 2003). The declaration makes recommendations on several categories of genetic resources as determined by both taxonomy (PGRFA, genetic resources of forest trees and of animals) or type (wild, *ex situ* conserved etc.). Here we will focus on access conditions to material in NordGen because this is where most work has been done. Benefit sharing is an integrated part of access regulation and the two concepts are thus considered simultaneously.

According to the Kalmar declaration, material in NordGen is under common Nordic management and in the public domain. The declaration goes on stating that relevant material in NordGen should be part of the Multilateral System of the International Treaty.

Following the adoption of the Kalmar declaration as well as of the sMTA of the treaty, the Nordic countries have focused their attention on developing detailed access regulation covering material in NordGen. This has turned out to be more complicated and more time consuming than originally expected. The problem has not been to lay out access conditions covering transfer of material within the Multilateral System – obviously the conditions of the sMTA will be applied here. In fact, NordGen has for some time now used the sMTA for transfers involving annex 1 material to be utilised for food and agricultural purposes. But access conditions to material - and to uses of material which are not part of the MLS according to the provisions of the treaty - have proven more difficult to determine.

An example may illustrate this: A lot of NordGen-material is every year being provided to hobby growers. The material comes either from NordGen's own collection or from duplicate collections (of specific crops) which are found in museums etc. in the Nordic countries. This is an excellent way to increase public awareness of PGRFA, to show the value of old varieties and to actively engage people in conservation issues. It is thus an activity that NordGen very much welcome and would like to stimulate.

However, it would be very detrimental for this type of activity if access to NordGen material for hobby purposes were to be regulated by the sMTA of the treaty. A lot of potential hobby growers are likely to turn their back on NordGen if they were presented with the 12 page sMTA and were asked to sign it in order to get an old potato variety from the gene bank's collection. Consequently, a short and simple MTA ("hobby MTA") covering this type of transfers had to be made.

Another aspect concerns the AEGIS project. As mentioned elsewhere in the report, AEGIS is a system for closer cooperation between gene banks which is currently under development in the European region. To be part of AEGIS, gene banks have to fulfil certain criteria, including giving access to their material on specific terms and conditions. The Nordic countries want to be part of this system and access conditions to material in NordGen consequently had to be modified accordingly. This has also taken some time to conclude. However, a report dealing with access conditions to

material in NordGen will be issued in near future. NordGen has already started to implement its recommendations.

Denmark has not yet placed any national collections of PGRFA in the Multilateral System, but has awaited the outcome of the above mentioned Nordic work. The recommendations from the Nordic report will be used as guidelines for the development of new access regulation to national collections.

7.2 Farmers' rights

The concept of Farmers' Rights and implementation of the Treaty's article 9 on the subject has not been discussed much in Denmark. Danish farmers participate already to a large extent in national decision making, including on issues relating to PGRFA. There is national legislation in place which allows for the use of farm saved seeds under certain conditions (UPOV 1 991).

7.3 Assessment of needs

We should identify collections to be included in the Multilateral System and modify access conditions to these collections accordingly.

We would welcome a discussion among parties of the treaty on the relevance, interpretation and implementation of Farmers Rights in countries like Denmark with a highly industrialised type of agriculture.

THE CONTRIBUTION OF PGRFA MANAGEMENT OF FOOD SECURITY AND SUSTAINABLE DEVELOPMENT

We do not know what the future will bring. But we know that crops will be grown. And that these future crops will have to be developed from the ones that exist today.

Consequently, food security and sustainable development is not possible without plant genetic resources for food and agriculture. Conservation of these resources must have very high priority. But conservation is not enough; the conserved material must also be put into use. The conserved material must therefore be characterised, evaluated and documented and it must be accessible.

It is not just a national task to ensure that this is done. All countries, including Denmark, are highly dependent on crops that originated in other countries. National activities are important, but they must go hand in hand with regional and international cooperation. What is needed is a well functioning global system for the conservation and use of plant genetic resources for food and agriculture.

Denmark will continue to work, both at the national and international level, on the development of such a system.



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