Appendix 1

Response of the CAs to the request of existing environmental monitoring programs suited for some aspects of general surveillance

Austria

Subject: Austrian Statement on General Surveillance and Monitoring
As Austrian Competent Authority according to Directive 2001/18/EC, the Federal Ministry of Health and Women - Department IV/B/12 is pleased to send you a statement of our national experts upon your request of 17 August 2004 concerning national monitoring programs:

a) Available information on existing monitoring programmes in Austria
The following list gives - without claiming completeness[1] - an overview on existing monitoring programmes in various fields (e.g. agriculture, nature protection). These medium orientated programmes have originally been established primarily in order to assess pollution levels. Depending on the demands on GMO monitoring (see **c)** below) however it can be expected that only limited use could be made of these programmes. So far no thorough compilation of existing monitoring programmes has been conducted in Austria with a view to a possible adaptation for GMO-monitoring.

- Air Quality Database
- Water Quality Database
- Soil Inventory (covering Austrian soils only to a certain extent)
- Forest Inventory (the only representative random sampling system in Austria at the moment)
- Forest Damage Monitoring
- Integrated Monitoring Programme (long-term ecosystem research programme in the Alps)
- Statistik Austria
- Federal Office of Metrology and Surveying (Bundesamt für Eich- und Vermessungswesen BEV)

The conceptual preparatory work for the establishment of a nation wide Biodiversity Monitoring System (MOBI) is currently under way. Moreover there is the intention to develop a monitoring concept for FFH protection areas.
In addition there are a lot of databases and registers established containing other relevant information. Beside basic inventories there are also data resulting from inspections available. All these constitute valuable instruments that could be made use of for the general surveillance of GMOs. Again this list is not complete and it should be taken into account that data are collected at different levels (national, federal or regional), sometimes are heterogeneous and not merged at national level.

- Bird Inventory (Birdlife is striving to build up a random sampling net for common bird species with volunteers)
- Basic inventories (flowering plants, amphibians & reptiles, a few groups of insects), in which the information is summarized often over decades in a barely standardized way. Therefore this information can only be used for monitoring programmes with reservations.
- Red lists of threatened species
- Red list of threatened habitats
- Cultural Landscape Mapping (Kulturlandschaftskartierung Österreichs)
- Areas of Seed Reproduction (Saatgutvermehrungsflächen)
- Viticultural Inventory (Weinbaukataster)
- INVEKOS database in which a substantial amount of data of all farmers requesting government aid (90%) is collected. This includes data specified for each field (e.g. farming practices, crop plant etc.). Personal data as well as data concerning the economic situation of the farms are handled in a very restrictive way. This database is of special interest for the establishment of the GMO register according to 2001/18/EC.
- Protected Areas Database (Schutzgebietsdatenbank)
- FFH-areas databases

b) Studies evaluating the possible use or adaptation of existing monitoring programmes for the general surveillance of GMOs

[1] In case monitoring programmes are not yet known in detail, the institutions or agencies that probably conduct relevant programmers are listed.

So far no studies have been conducted in Austria evaluating the potential use or adaptation of existing monitoring programmes for the general surveillance of GMOs. The only study of that kind to be known in Austria has been conducted in Switzerland by Hintermann & Weber AG on behalf of the BUWAL[2] (the study is sent as enclosure). Although in German, it is herewith made available to the Working Group.

However a framework concept for the ecological monitoring of GMOs in Austria was developed[3]. With the framework concept for ecological monitoring a rather broad approach was chosen by focusing on the environment as a whole. Accordingly the main goal is to protect the national targets of nature conservation. This approach which focuses on the receiving environment is considered an indispensable contribution to a discussion that so far has tended to focus on the GMOs rather than different environments in Europe. The Working Group on post market monitoring has already been provided with the condensed English version of this study in June[4] 2004.

c) Comments and suggestions on the possible use or adaptation of existing monitoring programmes as well as suggestions concerning open questions that need to be resolved and the possible set up of new specific programmes with respect to GMOs

Before evaluating the possibilities for the adaptation of existing monitoring programmes, the specific demands on GMO monitoring with respect to general surveillance need to be identified. This also leads to questions concerning the specific aims of case specific monitoring and general surveillance. The possibility to make use of existing programmes varies depending on the questions posed by the GMO monitoring and the original intention the existing monitoring programme was set up for. For example unintended effects on non-target species may be detected in a biodiversity monitoring programme adapted to GMO related questions. Also an existing monitoring programme may to some extent be of use for questions posed in case specific monitoring.
In Austria a study assessing the practicability of the theoretical concept for an environmental monitoring was conducted laying the basis for an ecological monitoring by means of two case studies (OSR and maize)[5]. The results suggest (and another study affirming this idea is expected to be finalized in spring 2005) that costs can be reduced significantly by focusing the investigations on "Biodiversity-Hotspots" in the agricultural landscape.
It has to be further discussed which specific instruments and programmes have to be developed for GMO monitoring also in the area of general surveillance. Also because only for a few special questions nation wide random sampling based monitoring systems seem to be necessary.

However the improvement of baseline data seems to be very important regarding the evaluation of unintended effects resulting from GMO cultivation. In this respect special attention should be laid on the mapping of plants in non-protected areas, in particular ruderal and segetal populations, their dynamic, their genetic diversity and their geographic distribution.
Further more according to Annex VII of Directive 2001/18/EC under C3 it is quoted: "The design of the monitoring plan should: incorporate general surveillance for unanticipated adverse effects and, if necessary, (case-) specific monitoring focusing on adverse effects identified in the e.r.a.: whereas surveillance could, if appropriate, make use of already established routine surveillance practices such as the monitoring of agricultural cultivars, plant protection, or veterinary and medical products. An explanation as to how relevant information collected through established routine surveillance practices will be made available to the consent-holder should be provided."

In this respect it has to remarked that federal institutes for plant protection according to the Austrian Plant-Protection-Act (BGBl. Nr. 532/1995, idgF "Pflanzenschutzgesetz") exist and have relevant data at their disposal.

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[2] HINTERMANN & WEBER AG (2003): Mögliche Synergien zwischen einem GVO-Monitoring und anderen Monitoringprogrammen in der Schweiz. Öko-Logische Beratung Planung und Forschung. Im Auftrag des BUWAL, Abt. Biotechnologie und Stoffflüsse

[3] TRAXLER A. et al. (2000): Ökologisches Monitoring von gentechnisch veränderten Organismen. Monographien Band 126. Umweltbundesamt Wien.

[4] TRAXLER A: et al. (2001): Ecological Monitoring of Genetically Modified Organisms. Monographien Band 147. Umweltbundesamt Wien.

[5] HEISSENBERGER et al. (2003): Durchführung von Untersuchungen zu einem ökologischen Monitoring von gentechnisch veränderten Organismen. Forschungsberichte 4/03. Bundesministerium für Soziale Sicherheit und Generationen

Further more federal agencies like the AGES (Austrian Agency for Health and Foodsafety) collect data from monitoring programs on seed and plant material.
These routine examinations can also be regarded as suitable for an EU-wide general surveillance due to the fact that in general they are based on EU-law and are carried out in a uniform way.

Czech Republic

Routine environmental monitoring or surveillance programs in the Czech Republic which may be suitable for general surveillance of GMOs
Response to the request of the working group on post market monitoring of GMOs

Basic information:

Relevant administrative bodies pursuant to the Czech Act on the use of GMOs and their tasks dealing with general surveillance:

- the Ministry of the Environment and its bodies - **nature conservation, long-term ecological monitoring and environmental observation, biodiversity monitoring programs,**
- the Ministry of Health and its bodies, especially National Institute of Public Health - Centre for the Hygiene of Food Chains - **food surveys, monitoring of the presence of GMOs in food**,
- the Ministry of Agriculture – **best agricultural practices**,
- the Czech Environmental Inspection (hereinafter the "Inspection"),
- the customs authorities,
- the bodies of the veterinary administration,
- the Central Institute for Supervising and Testing in Agriculture - **monitoring and inspection of agricultural crops, variety testing, seed certification, pesticides and fertilisers application,**
- the State Institute for Drug Control – approval and **monitoring of drugs**,
- the Institute for State Control of Veterinary Biopreparations and Drugs – approval and **monitoring of veterinary drugs and biopreparations**,
- the State Phytosanitary Administration – authorisation of pesticides, **plant protection, monitoring occurrence of crop pests and diseases, weed and other pest control,**
- the Czech Agriculture and Food Inspection Authority – **monitoring of the presence of GMOs in food,**
- the bodies of public health protection – **monitoring of state of health of the public**, monitoring and control of diseases and epidemiological situation.

The next step will be gathering detailed information on specific programs. However, lot of information is available in the Czech language only. The Czech CA – the Ministry of the Environment will try to provide summaries of these documents in English.

Denmark

Overview of monitoring of habitats, biodiversity, and species status in the terrestrial environment in Denmark
Morten Strandberg National Environmental Research Institute, Denmark

The overview presented below should not be considered as a complete list of all present and past terrestrial monitoring in Denmark. The list contains information on monitoring of GMO's and other terrestrial monitoring activities, which may apply to general surveillance of GMOs, including distribution mapping projects and endangered and invasive species. Recently Denmark has implemented a large national monitoring program, NOVANA to fulfil the requirements of EU-legislation in connection with the EU-Habitat and Bird Directives. The NOVANA program has replaced many preceding terrestrial monitoring activities in Denmark. Besides monitoring activities in the terrestrial environment,

monitoring also takes place in limnic, marine and atmospheric environments, which, however, was not included in the list.

GMO	STATUS	INSTITUTION	CONTACT
GMHP-monitoring *Glyphosate tolerant fodder beet*	Stopped	NERI Vejlsøvej 25 8600 Silkeborg Denmark www.dmu.dk	Beate Strandberg +45 8920 1769 http://www2.dmu.dk/1_viden/2_Publikationer/3_fagrapporter/rapporter/FR410.pdf Strandberg, B. 2004: Responses of farmland wildlife to genetically modified herbicide-tolerant crops. - AgBiotech Net 6: 1N-7N
OTHER TERRESTRIAL MONITORING	**STATUS**	**INSTITUTION**	**CONTACT**
NOVANA – habitat monitoring program	Running	NERI Vejlsøvej 25 8600 Silkeborg Denmark www.dmu.dk	Hans Løkke +45 89201482 hlo@dmu.dk
NOVANA – species monitoring program	Running	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	Henning Noer +45 89201541 hn@dmu.dk
Forest condition surveillance Level 1 skovovervågning	Running	Skov og Naturstyrelsen Haraldsgade 53, 2100 København Ø www.sns.dk	Iben Margrethe Thomsen, FSL +45 35281664 imt@kvl.dk
Forest monitoring Level 2 skovovervågning	Running	Skov og Naturstyrelsen Haraldsgade 53, 2100 København Ø www.sns.dk	Iben Margrethe Thomsen, FSL +45 35281664 imt@kvl.dk
UN-ECE Critical load mapping	Running	NERI Vejlsøvej 25 8600 Silkeborg Denmark www.dmu.dk	Jesper Bak +45 8920 1448 jlb@dmu.dk
UN-ECE CLRTAP integrated monitoring of ecosystems	Pause	NERI – Denmark Vejlsøvej 25 8600 Silkeborg Denmark www.dmu.dk	Knud Erik Nielsen +45 89201571 ken@dmu.dk
NFI Forest Statistics **NFI skovstatistik flora, vegetation, jordbund**	Running	http://data.fsl.dk/NFI/NFI%20Background%201.pdf	http://data.fsl.dk/NFI/NFI%20Background%201.pdf
Game animal statistics	Running	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	Tommy Asferg ta@dmy.dk
Raised bog monitoring	Stopped *Continues*	Skov og Naturstyrelsen	Mette Risager +45 86466022

	in NOVANA	Haraldsgade 53, 2100 København Ø www.sns.dk	
Poor fen monitoring	Stopped	Skov og Naturstyrelsen Haraldsgade 53, 2100 København Ø www.sns.dk	Mette Risager +45 86466022
Small biotopes monitoring	Stopped *Continues in NOVANA*	Skov og Naturstyrelsen Haraldsgade 53, 2100 København Ø www.sns.dk	Peder Agger Roskilde University, Denmark
Bird monitoring	Running	DOF Vesterbrogade 140 DK-1620 Kbh V Tlf. +45 3331 4404 Fax. 3331 2435 dof@dof.dk	http://www.dofbasen.dk/ART/ http://www.dof.dk/05_projekter/punkttaelling/Nyhedsbrevapr2004.html
Orchid Monitoring	Running	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	http://www.dmu.dk/Dyr+og+planter/Planter/ Peter Wind +45 89201544 pwi@dmu.dk
Surveillance of higher plant species on the Danish Red List	?	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	http://www.dmu.dk/1_viden/2_Publikationer/3_arbrapporter/rapporter/AR156.pdf Peter Wind +45 89201544 pwi@dmu.dk
Monitoring for counties and municipalities/local authorities. § 3 monitoring	?	NERI Denmark Grenåvej 12 8410 Rønde Denmark www.dmu.dk	http://www.dmu.dk/Overv%C3%A5gning/
Rich fen monitoring	Continues in NOVANA	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	Peter Wind +45 89201544 pwi@dmu.dk
Grassland monitoring	Continues in NOVANA	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	Peter Wind +45 89201544 pwi@dmu.dk
Fungi monitoring	Running	Danish Mycological Society http://www.mycosoc.dk	Jan Vesterholt myco@vip.cybercity.dk
DISTRIBUTION MAPPING	STATUS	INSTITUTION	CONTACT
Biodiversity Mapping in relation to Global Warming	Running	http://www.gbif.org/GBIF_org/what_is_gbif	http://www.gbif.org/GBIF_org/what_is_gbif
Atlas Flora Danica - a mapping of the Danish	Running	Dansk Botanisk Forening	Per Hartvig +45 35 32 21 98

flora with a total duration of 15 years (1992-2007).		Sølvgade 83 DK-1307 Copenhagen K dbotf@mail.tele.dk	perh@bot.ku.dk
Butterfly survey Atlas projektet Danmarks dagsommerfugle	Stopped	Lepidopterologisk Forening, Copenhagen http://www.lepidoptera.dk/	Michael Stoltze +45 33 91 91 91
RED LISTS	**STATUS**	**INSTITUTION**	**CONTACT**
Red List of plants and animals in Denmark 1997 *Michael Stoltze & Stefan Pihl*	Latest version	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	Stefan Pihl +45 89 20 15 06 sp@dmu.dk
Yellow List of plants and animals in Denmark 1997 *Michael Stoltze*	Latest version	NERI – Grenåvej 12 8410 Rønde Denmark www.dmu.dk	Michael Stoltze +45 33 91 91 91
INVASIVE SPECIES	**STATUS**	**INSTITUTION**	**CONTACT**
Introduced species in the Nordic countries, Nord 2000:13 I.R. Weidema (2000)	Latest version	Nordic Council of Ministers. www.norden.org	Inger Weidema irw@sns.dk

Finland

FINNISH ENVIRONMENTAL MONITORING PROGRAMS POTENTIALLY SUITABLE FOR GMO–MONITORING

Introduction:

A national action plan has been developed for studying and preserving biodiversity in Finland. In the context of implementing this action plan, data has been collected of the various biodiversity monitoring programs in Finland and their suitability for general national monitoring has been evaluated. The monitoring programs can be divided into general and special monitoring, and also to landscape- or biotope-specific, genera-specific, species-specific etc. These classification criteria are not always suitable when in comes to GMO-monitoring, and thus, on selecting potential GMO-monitoring programs, other criteria have been used.

Currently seven government institutions are involved in nation-wide monitoring:

- Finnish Museum of Natural History (LTKM)
- University of Helsinki (HY)
- MTT Agrifood Research Finland (MTT)
- Finnish Institute of Marine Research (MTL)
- Forest and Park Services (MH)
- Finnish Forest Research Institute (METLA)
- Game and Fisheries Research Institute (RKTL)
- Finnish Environment Institute (SYKE)
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In addition to these, three non-governmental organizations are also involved in nationwide monitoring:

- BirdLife Finland
- Finnish WWF
- South-Carelian Environment and Allergy Institute

It should be noted that many of the monitoring programs rely on observations by volunteers, whose interest is linked to the monitoring issue.

Many of the biodiversity monitoring programs are not suitable for GMO-monitoring for various reasons (too few monitoring areas, monitored species not relevant or too high up in the food chain, reporting in

atlas form only, gallup surveys, one person responsible for the project, future financing unclear etc.). In the following suggestive lists, many biodiversity monitoring programs have been dropped out for these reasons.

Biodiversity monitoring programs potentially suitable for surveillance of effects of GM-plant cultivation:

The following general monitoring programs are included in the proposed national biodiversity monitoring program and could be potentially useful in the general surveillance of GM-plants (incl. GM-trees):

- census of breeding land birds; long term changes (LTKM)
- census of breeding land birds; yearly changes (LTKM
- winter bird census (LTKM)
- monitoring of farmland birds in agroecosystem (RKTL)
- the butterfly monitoring scheme in Finnish agricultural landscapes (SYKE)
- the survey of Finnish herpetofauna (the Finnish herpetological atlas) (LTKM
- field triangle scheme (RKTL
- weed survey in spring cereal fields (MTT)
- national forest inventory; forest resources inventory (Metla
- national forest inventory; monitoring of the health of forests (Metla)

It appears that the possibilities for monitoring effects on bird population size and distribution are promising, but the relevant species for GMO-monitoring must be identified. Also butterfly monitoring should not be too problematic in Finland. Monitoring of vertebrates other than birds is a problem and definitely would need developing, but the relevant species should be chosen first. In some cases the monitoring program would be otherwise suitable for GMO-monitoring, but the monitoring frequency should be increased (e.g. weed survey by MTT has currently 10 year intervals, the survey of Finnish herpetofauna 10-15 year intervals).

There are also some other monitoring programs which may be suitable when GM-plants are regarded, but with some reservations only:

- aphid monitoring (LTKM) and oat aphid monitoring (MTT): the continuation of these programs is unclear
- pollinator monitoring (SYKE): this program would need more experts
- distribution mapping and monitoring of vascular plants (LKTM): this program yields currently only atlas-type data and thus needs developing to be suitable for GMO-monitoring

In some (few) cases monitoring of endangered species may be relevant. For this purpose at least the following monitoring programs exist:

- monitoring of endangered plant species (SYKE)
- monitoring of rare and endangered bird species (BirdLife)

Monitoring of waterways may turn out necessary to monitor the indirect effects of GMO-use (e.g. changed use of herbicides and pesticides). Currently there are a couple of monitoring programs none of which is directly suitable for GMO-monitoring. However, biomonitoring of Finnish waters will change when the EU water frame directive is fully implemented. The changes in monitoring programs are expected to make them more suitable for monitoring indirect GMO-effects. Also, it should be mentioned that although the above-mentioned monitoring programs were collected thinking of surveillance of GM-plant effects, there are also several biodiversity programs potentially suitable for general surveillance of effects of GM-fish should they become accepted for cultivation.

Conclusions:
The above-mentioned biodiversity monitoring programs are selected for their potential usefulness in general surveillance on effects of GM-plant cultivation. This leaves out other GM-groups such as GM-fish, -mammals, -insects, -microbes etc. as we considered their surveillance less acute. It turned out that the current monitoring programs may not be directly suitable for GMO-monitoring, but some could be developed for that purpose by choosing carefully the relevant monitoring areas and species and sometimes by also increasing the monitoring frequency, which should in our opinion have minimum 1-3 year intervals and extend to at least 2-3 generations in general. One of the critical questions is what should the general surveillance actually cover in practice in each case and this should be thoroughly discussed in the working group. Also such questions as the monitoring interval, continuity of the

monitoring programs, maintaining the necessary expertise (by training and recruiting the professionals and amateurs participating in the surveillance) and reporting should be discussed. When exploiging existing monitoring programs we find reporting a critical issue: who reports to whom, in which format and how often? Reporting and analyzing the data is a considerable burden itself, not to mention a situation if it should be in different format or more often than earlier.
Currently it seems that not much general monitoring is undergoing in agro-ecosystems in Finland. As the situation may be currently undergoing changes, we are still working on this subject trying to find more information. At least it seems that monitoring of earthworms is starting in the future (MTT), but with only 10-15 year intervals. A program focusing on monitoring of vascular plants, butterflies, bees and nesting birds has recently taken place in agro-ecosystems, but the continuation of this program is currently unclear to us. We will report later about our progress.

France

PARASITOIDS of ostrinia nubilalis Hübner DISTRIBUTION in France – synthesis from 2001 to 2004
A biological observation network is drived since 2001 in order to characterize generation number of Ostrinia nubilalis Hübner [Lepidoptera : Pyralidae], the major pest of maize, and the nature of parasitoïds regulating their populations. After 4 years of follow-up it is possible to describe the parasitoïds identified : two species of dipterae as Lydella thompsoni [Diptera : Tachinidae] and Pseudoperichaeta nigrolineata [Diptera : Tachinidae] and seven species of micro-hyménoptera. Their repartition over the 250 sites and the 20 areas suited is hyghly variable. The parasitism rate is also achieved and the difficulties of these kind of work is highlighted.

Germany

Schutzgüter	Beobachtungsprogramm	Beobachtungsgegenstände (soweit bekannt)	Beobachtungsraum	Betreiber Ansprechpartner	Informationen	Kommentare
Biodiversität	Wildtierinformationssystem der Länder Deutschlands	Populationsdaten zu den Bejagbahren Arten Feldhase, Rotfuchs, Dachs, Rebhuhn, Aaskrähe Probenahme jährlich	ausgewählte Referenzgebiete, bundesweit	Jagdschutz-Verband e.V. Armin Winter Johannes-Henry Str. 26 D-53113 Bonn Tel 0228 9490631	http://www.jagdnetz.de/community/dokumente/download/FlyerWILD.pdf	seit 2000
	Monitoring häufiger Brutvogelarten	Populationsentwicklung weit verbreiteter Brutvogelarten Brutvögeln, 100 Arten, Wasservögel, Greifvögel, Singvögel und andere, Aufnahme je Probenahmeort alle 5 Jahre	1000 Stichprobenflächen à 1km Größe für bundesweite Auswertung, unterschiedlich viele Stichproben für Fragestellungen auf Länderebene (Σ 2637), bundesweit	Dachverband Deutscher Avifaunisten Johannes Schwarz Zerbster Str. 7 39264 Steckby email schwarz@dda-web.de	http://www.dda-birdrace.de/	Erhebungen durch Ehrenamtlich, seit 1989 Daten fließen ins Pan-European Common Bird Monitoring ein, Europa weites Programm mit 36 teilnehmenden Ländern
	Monitoring geschützter und gefährdeter Brutvogelarten	Bestandsentwicklung geschützter und gefährdeter Brutvogelarten	Einzelerhebungen, lokale und regionale Monitoringprogramme	Dachverband Deutscher Avifaunisten (DDA) e.V. Geschäftsstelle Zerbster Str. 7, 39264 Steckby Tel.: 039244.940918 email info@dda-web.de	http://www.dda-birdrace.de/ http://www.bfn.de/0315_vogelmonitoring.html	Vogelschutzwarten Erhebungen durch Ehrenamtliche
	Tagfalter-Monitoring	Bestandserfassung von Tagschmetterlingen	durch ErfasserInnen festgelegte Transekte, bundesweit	UfZ Department of Community Ecology Josef Settele Theodor-Lieser-Str. 4 06120 Halle Tel. 0345 5585320 email josef.settele@ufz.de	http://www.tagfalter-monitoring.de/	im Aufbau befindlich, Erhebungen durch Ehrenamtliche, ähnliche Programme in der Schweiz, Niederlanden, UK
	Deutsches Bienenmonitoring	Entwicklung von Bienenvölkern, Krankheiten, Honigertrag, Rückstandsdaten zu PSM	Ausgewählte Referenzgebiete, bundesweit	Projektrat des Bienenmonitorings Peter Rosenkranz Landesanstalt für Bienenkunde der Universität Hohenheim (730) 70593 Stuttgart email bienero@uni-hohenheim.de	http://www.gesundebienen.de/89/Krankheiten/Bienenmonitoring/Deutsches_Bienenmonitoring.htm	seit 2005

Schutzgüter	Beobachtungsprogramm	Beobachtungsgegenstände (soweit bekannt)	Beobachtungsraum	Betreiber Ansprechpartner	Informationen	Kommentare
	Ökologische Flächenstichprobe	Ziel ist eine periodische und bundesweit repräsentative Datenerfassung zur Struktur von Landschaften und Biotopen sowie zu deren Artenausstattung als Grundlage für ein Monitoring Basisvariante: Biotoptypenkartierung, Blütenpflanzen und Brutvögel In NRW: Nutzungstypen, Biotoptypen, Biotopstrukturen, Brutvögel, Farn- und Blütenpflanzen in Bezug zu ausgewählten Biotoptypen	1000 Stichprobenflächen à 1 km² für bundesweite Auswertungen Zusätzliche für Auswertungen auf Landesebene stratifiziert nach ökologischen Klassen bundesweite Umsetzung im Konzept vorgesehen In NRW: 120 Stichprobenflächen à 1 km² stratifiziert nach Landschaftsräumen	Bundesländer, In NRW: Landesamt für Natur, Umwelt und Verbraucherschutz, NRW (Landschaftsmonitoring)	http://www3.lanuv.nrw.de	Konzept erstellt, Umsetzung bisher nur in NRW
	Nachhaltigkeitsindikator für die Artenvielfalt	Ziel des Indikators ist es, auf anschauliche Weise den Zustand von Natur und Landschaft abzubilden	bundesweit	Bundesregierung	http://www.bundesregierung.de/nn_1270/Webs/Breg/DE/Politikthemen/Umwelt/NachhaltigeEntwicklung/nachhaltige-entwicklung.html http://www.bfn.de/0315_nachhaltigkeit.html	
	Integriertes Singvogelmonitoring bestehend aus: 1.Singvogelmonitoring 2.Heckenprogramm 3.Höhlenbrüterprogramm	1.Beringungsprogramm, langfristige Bestandskontrolle einheimischer Vogelarten 2.Netzfang und Revierkartierung zur Erfassung populationsdynamischer und reproduktionsbiologischer Aspekte von Heckenvögeln 3. langfristige Bestandsbeobachtungen von in Höhlen brütenden Kleinvogelarten verschiedene Singvogelarten	1.Fangplätze in den Bundesländern 2.Hecken 3. Nistkästen	Bundesländer, Vogelwarten	z.B. http://www.vogelkunde-untermain.de/hecke.htm, http://www.mu.sachsen-anhalt.de/start/wir_ueber_uns/publikationen/files/vogelmonitoringlsa2003.pdf	entstanden aus der Zusammenlegung des Hecken- , Höhlenbrüterprogramms und Singvogelmonitorings Das Integrierte Singvogelmonitoring ist im Aufbau z.T. Erhebungen durch Ehrenamtliche

Schutzgüter	Beobachtungsprogramm	Beobachtungsgegenstände (soweit bekannt)	Beobachtungsraum	Betreiber Ansprechpartner	Informationen	Kommentare
	Greifvögel & Eulen Europas	Erfassung von Bestand und /oder Reproduktion einer oder mehrerer Greifvogel- und/oder Eulenarten	Auf durch die ErfasserInnen bestimmten Kontrollflächen von mindestens 15 km²	Monitoring Greifvögel und Eulen Europas Schülershof 12 D-06108 Halle / Saale E-Mail: uk.mammen@t-online.de	http://www.greifvogelmonitoring.de/daten.html	Europa weites Programm in 18 EU Staaten, Daten z. T. seit 1957 Erhebungen durch Ehrenamtliche, in 18 weiteren EU-Mitgliedstaaten
	Naturschutz- und Artenmonitoringprogramme der Länder	floristische und faunistische Daten		Bundesländer		
	FFH-Monitoring	Überwachung des Erhaltungszustandes (Monitoring) der Lebensraumtypen (Anhang I) und Arten (Anhänge II, IV und V) von europäischem Interesse	FFH-Gebiete, bundesweit	Bundesländer, Koordination BfN	http://www.bfn.de/0315_ffh_richtlinie.html	Stand der Umsetzung in den Bundesländern unterschiedlich, alle EU-Länder sind verpflichtet FFH Gebiete zu beobachten
Bodenfunktion	Bodendauerbeobachtung	Veränderung und Entwicklung von Böden, Schadstoffakkumulation	ca. 800 Stichprobenflächen, Acker, Forst/Wald, Grünland, Siedlung, Sondernutzung	Bundesländer, UBA	http://www.umweltbundesamt.de/boden-und-altlasten/boden/bodenschutz/dauerbeobachtung.htm	
	Bodenbeobachtung VDLUFA	Bodenanalysen	Ackerflächen,	VDLUFA c/o LUFA Speyer Obere Langgasse 40 67346 Speyer Tel. 06232 136-0 email info@vdlufa.de	http://www.vdlufa.de	Fachgruppen; Lokale Ansprechpartner; Auftragsanalytik; keine allgemeinen Routinestatistiken
	Umweltprobenbank	Probenahme und Archivierung von Umweltproben, verschiedene Indikatorarten (Pflanzen, Tiere), Monitoring von Schadstoffen		UBA	http://anubis.uba.de/wwwupb/servlet/upb	
Gewässer	regionale und örtliche Messnetze der Gewässerüberwachung	Überwachungsprogramme der Bundesländer		Bundesländer		Unterschiede hinsichtlich der gemessenen Parameter und Messpunktdicht in den Ländern

Schutzgüter	Beobachtungsprogramm	Beobachtungsgegenstände (soweit bekannt)	Beobachtungsraum	Betreiber Ansprechpartner	Informationen	Kommentare
	Landesmessnetze	Überwachungsprogramme der Bundesländer		Bundesländer		Unterschiede hinsichtlich der gemessenen Parameter und Messpunktdicht in den Ländern
	Bundesweite Gewässergütekartierung	LAWA Messstellen an großen Flüssen		BUND/Länder Arbeits-gemeinschaft Wasser (LAWA), Bundesländer	http://www.lawa.de	
	PERLODES	Libellen, andere Insekten, Mollusken, andere Invertebraten, insgesamt 946 Arten,	7000 Stichprobeorte	Universität Duisburg-Essen Daniel Hering Universitätsstr. 2 45141 Essen Tel 021 1833084 email daniel.hering@uni- due.de	http://www.uni-duisburg-essen.de/hydrobiologie/	seit 2005
Nachhaltige Landwirtschaft	NEPTUN	Indizierter Umfang des PSM-Einsatz		BBA	http://www.bba.bund.de/nn_921032/DE/Home/koordinieren/neptun/neptun__node.html__nnn=true	Nicht kontinuierlich; Erhebungen beschränkt auf bestimmte Kulturen, Zukunft aufgrund finanzieller Ausstattung unklar
	Sortenprüfung	Daten aus der Sortenprüfung	bundesweit	BSA / Antragsteller	http://www.bundessortenamt.de	Fruchtart-Prüfplanabhängige Aussagen zur Sortenqualität; Bewertung der gentechnischen Veränderung in verschiedenen genetischen Hintergründen
	Nachhaltigkeitsindikator	21 Schlüssel-Indikatoren	bundesweit	Bundesregierung	http://www.bundesregierung.de/nn_1270/Webs/Breg/DE/Politikthemen/Umwelt/NachhaltigeEntwicklung/nachhaltige-entwicklung.html	nur ein Teil der Indikatoren (z.B, Artenvielfalt, Ernährung) wird für eine Allgemeine Beobachtung zu nutzen sein

Schutzgüter	Beobachtungsprogramm	Beobachtungsgegenstände (soweit bekannt)	Beobachtungsraum	Betreiber Ansprechpartner	Informationen	Kommentare
	Umwelt - Kernindikatorensystem	Instrument zur Erkennung positiver oder negativer Entwicklungen in Handlungsfeldern des Umweltschutzes	bundesweit	UBA	http://www.env-it.de/umweltdaten/public/theme.do?nodeIdent=2702	evtl. einige der Kernindikatoren für eine GVO-Beobachtung nutzbar, z.B. Indikatoren zur Artenvielfalt oder Landwirtschaft
Pflanzenschutz	Sortenprüfung	Daten aus der Sortenprüfung	bundesweit	BSA / Antragsteller	http://www.bundessortenamt.de	Fruchtart-Prüfplanabhängige Aussagen zur Sortenqualität; Bewertung der gentechnischen Veränderung in verschiedenen genetischen Hintergründen
	Pflanzenschutzdienste /ISIP	Pflanzen-Schädlinge, Krankheiten	Bundesländer	Pflanzenschutzdienste der Länder	http://www.isip.de	ISIP: Beschränkt auf best. Feldfrüchte und Schädlinge; z.Z. auf Beratung der Landwirte fokussiert PSD: Regional/länderspezifisch organisiert; Beraternetzwerke
	AG Resistenzen	Schädlingsresistenzen: Fungizide, Herbizide, Insektizide, Rodentizide		BBA; DPG	http://www.bba.bund.de/cln_045/nn_921062/DE/Home/pflanzen__schuetzen/pfsmittel/resistenz__psm/resistenz__psm__node.html__nnn=true; http://p11631.typo3server.info/herbizidresistenz_u.html	Informelle Experten-Netzwerke unter Beteiligung verschiedener Institutionen. (Im Aufbau)
Tiergesundheit	Überwachung der Futtermittel			Privatwirtschaftl. QM; Labore der VDLUFA	http://www.vdlufa.de	Fachgruppen; Lokale Ansprechpartner; Auftragsanalytik; keine allgemeinen Routinestatistiken
	Jagdwissenschaftliche Institute, Institut für Wildtierforschung	Toxikologische Wirkungen durch verändertes Fraßverhalten bei Wildtieren (Dachs, Hase, Reh)				

Schutzgüter	Beobachtungsprogramm	Beobachtungsgegenstände (soweit bekannt)	Beobachtungsraum	Betreiber Ansprechpartner	Informationen	Kommentare
	Bienenvergiftungen	Analyse von Bienenvergiftungen (PSM)		BBA Untersuchungsstelle für Bienenvergiftungen Messeweg 11 / 12 38104 Braunschweig	http://www.bba.bund.de/cln_044/nn_1003268/DE/Home/pflanzen__schuetzen/bienen/bienen__node.html__nnn=true	
Menschliche Gesundheit	Umweltprobenbank	Probenahme und Archivierung von Humanproben	wenige Probenahmepunkte	UBA	http://anubis.uba.de/wwwupb/servlet/upb	
	ggf. Landesämter für Arbeitsschutz/ Landwirtschaftliche Berufsgenossen-schaften/ Arbeitsmedizinische Dienstes					
	Human-Biomonitoring			GSF-Forschungszentrum für Umwelt und Gesundheit	http://www.gsf.de/infostelle-humanbiomonitoring/index.php	Im Aufbau
	Lebensmittel-Monitoring	Anteil von GVO in Lebensmittel sowie Verstöße gegen geltendes Recht vorliegen	bundesweit	BVL	www.bvl.bund.de	
ohne direkte Verbindung zu Schutzgütern	Standortregister	Lage von GVO Flächen	bundesweit	BVL	www.bvl.bund.de	
	Bodennutzungshaupt-erhebung	Flächenerhebungen nach Art der tatsächlichen Nutzung	bundesweit	Bundesländer, Statistisches Bundesamt		
	EU-MON		europaweit (EU)	UFZ Department of Conservation Biology Klaus Henle Permoser Str. 15 04318 Leipzig	http://eumon.ckff.si/index1.php	kein Beobachtungsprogramm per se, aber eine Erhebung welche Beobachtungsprogramme in Europa durchgeführt werden, als zusätzliche Quelle für Informationen evtl. geeigneter Beobachtungsprogramme

Permanent soil monitoring program (BDF)
The BDF is a program for the long-term monitoring of changes in soil conditions and soil functions. It serves implementation of the Federal Soil Protection Act (Bundesbodenschutzgesetz). At more than 800 sites all over Germany microbiologica, physical, chemical and other soil parameters are recorded on a regular basis in combination with vegetation surveys. The sampling, processing and storage methods employed for the soil samples are also suitable for example for a molecular genetic detection of transgenic DNA in soils. It would be also possible for example to link the monitoring of possible mating partners and hybrids to this program.

Federal Environmental Specimen Bank (Umweltprobenbank)
The objective of the Environmental Specimen Bank is to record the medium and long-term substance exposures of man and the environment. To this end soil, animal, and human samples are collected, analysed for environmentally relevant substances and subsequently archived. It would be useful for example to ling the documentation of the dispersal, persistence and accumulation of transgenes in the environment with this specimen bank. The chemical, physical and biometric analysis of the samples could be extended to include the molecular genetic detection of gene constructs. It would be particularly useful to do this with respect to soil and sediment samples as well as for the contents of the digestive tract of animals. The samples stored in the Environmental Specimen Bank could generally also be used for the retrospective analysis of DNA sequences.

Biodiversity monitoring
A nationwide representative biodiversity monitoring program could be used for aspects of the GMO-monitoring. In North Rhine-Westphalia (federal state of Germany) such a biodiversity monitoring program based on random sampling sites has already been established (Ecological Area Sampling). It is planned that the recording of potential mating partners and hybrids will be carried out as part of this program.

Monitoring of bird species in Germany
In Germany bird monitoring programmes are operated by a range of organizations and institutions; some have been in operation for over 30 years. More than 3,500 voluntary ornithologists are involved in these programmes. The main part of the programmes is organized by NGO's or on the level of the Federal "Länder" with subsequent problems of standardisation and coordination on a federal basis.
In October 2003 the nation-wide project "monitoring of bird species in Germany" was launched. On the basis of existing programmes and through test runs and analysis a system for a harmonized and extensive bird monitoring including voluntary participation is to be worked out. An important step for bird monitoring in the wider countryside was the selection of 1,000 national sample plots by a stratified random sample. The project also includes the development of Internet tools for data input by voluntary bird watchers and for simplification of data transfer and analysis. The project will run until 2006. It will improve the data basis for reporting requirements such as those from the Birds Directive and several indicator systems.

Hungary

Hungarian Biodiversity Monitoring system:

Official control of the experimental release of genetically modified plant varieties in Hungary

In general:
In its decisons the competent authority prescribes that the consent holder has to take measures to prevent the unintentional release and unauthorized distribution on the market of genetically modified organisms or their parts.
Inspectors of the National Institute for Agricultural Quality Control supervise experimental fields of GMOs (in Hungary there are only experimental releases of GMOs at present). Inspections can be held any time however, normally it takes place at least one day before the inspection and the consent holder is allowed to fix an appointment with the inspector.
Inspectors supervise whether all the measures prescribed in the consent are taken in order to prevent unintentional release of GMOs.
In addition the following aspects are to be supervised:
Handling of seeds:

Seeds imported on the evidence of a distinct permit are to be stored in a place that can be locked safely. The consent holder has to keep a record of data on the quantity of seeds. The inspectors are allowed to check the records and the recent quantity of the stored grains.
The distribution and unpacking of seeds for each section of land have to be carried out above a table, in a room with solid flooring. Grains fallen on the floor must be thoroughly collected.
The seeds should be stored in a double-layered bag. A sign must be put on each bag stating that it contains genetically modified grains.
The organisation of the sowing:
The borders of the field where the experiment is carried out have to be clearly defined and marked in a manner that ensures they are obvious even after harvest.
A map must be drawn of the field where the experiment takes place. The map should have such a scale and accuracy that on the basis of permanent landmarks the area can be redesignated on the ground any time.
The seeds have to be taken to the experimental field in a container that has solid bottom and walls. During sowing the grains must be kept within the area of the experimental field.
The machines used for sowing, even when turning, cannot leave the experimental area (including the pollen trap zone).
The machines used for sowing must be perfectly cleaned after sowing.
It must be assured that no uncovered seed remains on the ground. The area has to be protected from game until the plants germinate.
Taking care of the experiment:
The consent holder's supervisor designated according to the law has to continously follow the appearance of pollen, seeds (or any other part involved in the reproduction of the species) and if the restricting provisions prescribe, remove and destroy them.
In experiments with corn, the tassel of the GM plants must be fully removed in time.
The plants, their parts and their derivatives used for experiments and investigations have to be taken back to the experimental field where they need to be destroyed.
In order to prevent theft, the experimental fields must be guarded.
Harvest of experimental releases:
Care must be taken to ensure that no seed (or other reproductive part) falls outside the GMO section of land.
The whole crop of the experiment (including that of the pollen trap) and any sample for analyses ought to be completely destroyed by means specified in the notification or in the consent.
Observing the area after the experiment:
After the harvest of the crop, the consent holder's supervisor is required to check the experimental field regularly in order to destroy before flowering any plant deriving from the GM seeds fallen on the ground during harvest.
As for the selection of the plants to be grown on the field after the experiment, the recommendations of the notification and the consent are to be followed.
The inspections of the experiments are organised by the National Institute for Agricultural Quality Control in such a way that one experiment has a permanent inspector. The findings of the inspections are recorded by the inspecting authority. The records are also signed by the consent holder's supervisors who have the right to express their differing opinion.

Ireland

Regarding your query about existing monitoring programmes which might be suitable for some aspects of general surveillance of GMOs, the Environmental
Protection Agency has written to a number of organisations and has received the following information.
The National Parks & Wildlife Service (under the Dept of the Environment, Heritage & Local Government) are carrying out monitoring of Natura 2000
sites and Natural Heritage Areas (NHAs) and reporting on the positive and negative impacts affecting such sites. In addition more detailed programs
are currently being devised for the annexed habitat types and species. These programs will monitor favourable conservation status of an annexed habitat type or species from a national perspective on a 5 - 10 year basis. A small
number of habitats and species will be selected each year depending on resources. We were also informed of a PhD Thesis which entailed a risk assessment investigating pollen dispersal from OSR. The project aimed to develop a better understanding of the potential risks of gene flow from GM Brassicasby examining biotic and abiotic pollen dispersal over 2 seasons. In addition a proposal under

the National Biodiversity Plan (2002) to complete a basic inventory on all species groups and habitats in Ireland was brought to our attention. This will require surveys and inventories to determine the distribution, abundance, conservation status, conservation importance and changes in status of species and habitats including protected sites. Of the three projects that we have been informed of, the third is probably the most relevant to our needs and I am currently trying to establish it's status.

Latvia

On 23rd of April 2004, Latvia approved monitoring programme “Control programme for 2004 year on labelling of GMO’s containing foodstuffs”, which determine:
- the aim of the programme;
- description of the problem;
- legal justification;
- methods;
- costs of the programme;
- executors of this programme;
- assessment of results;
- action of inspectors on GMO determination.

If you need more detailed information we can translate and send you this entire monitoring programme.

National Vegetation and Wildlife Monitoring Programmes

Netherlands

Analysis of existing environmental monitoring programs in the Netherlands
In 2003 a survey was commissioned by Ministry for the Environment with the purpose to identify all existing monitoring programs in the Netherlands which could also be useful to integrate in a general surveillance program for genetically modified (higher) plants (GMHP’s). These results were published in March 2004.
In general the conclusion was that very little is currently in place in the Netherlands which could be used to set up a general surveillance program for GMO’s. Especially over the last 10-15 years the market has changed from a producer-driven market to a customer-driven market. Many systems which were in place to ensure an uniform quality of products have become obsolete. Subsequently the criteria for product quality are no longer set by the Community Boards for Agriculture but are set by the buyers. As a result many monitoring programs are no longer compulsory or do not longer exist at all.

The survey covered:
- Cultivation of crops in general. Within the arable cultivation and horticulture several systems are/were in place with a signalling function, e.g. a warning system to support potato farmers to control Phytophtora infestations.
- Breeding and propagation of crops are strictly regulated in the Netherlands.
- In the Netherlands the organisation Milieukeur committed itself to stimulate environmentally friendly cultivation of crops. In order to achieve this goal they have set up a certificate system.
- In more detail a description of the existing monitoring programs for the crops potato, winter cereal, summer barley, maize, sugar beet, chicory, oilseed rape, chrysanthemum and tomato. Also the existing programs for plant protection products (including biological pest control products) are included.
- Existing survey programs to monitor changes in non-agricultural areas. In 2000 a national program has started to monitor roadside flora. Also provinces have the obligation to monitor flora and fauna in nature areas. However, there is a large variation between the efforts of the different provinces. Furthermore, there are several private initiatives which collect data on for example bird fauna or flora in general in the Netherlands.
- Existing systems regarding drugs for animals. By law there is an almost airtight system in place which controls the registration, production, import, distribution and administration of animal drugs.

As a result of this study, the Dutch government is currently writing a policy document with proposals to set up a general surveillance program for GMO’s in the Netherlands.

Norway

Existing monitoring programmes within Norway that may be of use for the general surveillance of GMOs

In response to your request of 3rd August 2004 please find a statement regarding the Norwegian national monitoring programs.

Existing monitoring programs in Norway

GMOs

Only two GMOs product has been approved in Norway; GM tobacco and GM carnation. Since neither tobacco nor carnations are grown in Norway, there has been no need for environmental monitoring of GMOs. Present Norwegian monitoring activity isperformed on an inspection basis. The purpose is to detect if GMOs are imported to Norway without approval, and are mainly focused on soy, maize and rapeseed in food, feed or as seeds. The responsible authorities for this monitoring are the Norwegian Food Safety Authority and the Ministry of Fisheries.

Other monitoring programs

A wide range of monitoring programs with relevance to the general surveillance of the impact of GMOS is carried out in Norway. Several of the large-scale monitoring schemes are long term and could provide good baseline data for ongoing general surveillance schemes. There are also various annual monitoring programmes such as the *agriculture and environment, the soil databases* and some of the *biodiversity* surveys that could be of relevance to GM surveillance. This list is not complete and details on the relevance and usefulness of each of these schemes for the general surveillance of GMOs is lacking.

Biodiversity Monitoring

An outline of Norwegian biodiversity monitoring schemes (all in Norwegian) can be viewed at: http://www.dirnat.no/wbch3.exe?p=3156

This site holds details of the types of organisms monitored and the frequency of the data collected. The Directorate conducts most of these surveys for Nature Management (DN), which is a national body that has the scientific responsibility for managing the Norwegian countryside. The Directorate is also responsible for monitoring the state of wildlife and the natural environment, and for identifying, preventing and solving environmental problems. Some of the selected schemes outlined in below are performed in cooperation with research institutions. Several of the schemes are long running and could provide good baseline data for general surveillance schemes of GMOs.

Terrestrial biodiversity (Terrestrisk naturovervåkning (TOV))

Since 1990 this has been a long-term integrated ecosystem research network designed to aid detection, interpretation and forecasting of environmental change resulting from natural and human causes (impacts by acid rain, climate change, long-distance transported pollutants, land use and ecosystem interactions). The focus is on responses e.g. flora and fauna at seven specific locations together with a national mapping of chosen parameters. The frequency of the surveillance is for fauna (rodents, passeriform birds, willow grouse, gyrfalcon and golden eagle) annually, while flora (lichen and algae on trees and wild flora) is done every 5th year. The national mapping is performed every 5th or 10th year and focuses on lichen and algae on trees, eggshell thickness and pollutants in bird of prey, and heavy metals in wild animals.

Endangered species

Many of these surveys are long running and regular measurements of population abundance and population changes are done. Species involve salmon, sea trout, polar fox, wolf, bear, lynx, glutton, seabirds, goose, crane, corncrake, goshawk, river mollusc, crawfish etc.

Monitoring of biodiversity in freshwater lakes and rivers

This is initiative that involves four different programs.

1. Regular measurement of 100 freshwater sites for main drivers of change e.g. climate change and substances that acidify watercourses. Fish and invertebrate population changes are monitored in lakes (initiated in 1996) and in rivers (initiated in 1980). The information provided is correlated to the chemical surveys done by the Norwegian Pollution Control Authority.
2. Chemical and biological surveillance of two specific rivers.
3. Surveillance of acid lakes (initiated in 1994).
4. Measurement of trophic condition in lakes.

Monitoring of marine, coastal and freshwater environments

Three different monitoring programs are carried routinely out (http://www.akvaplan.niva.no/)

1. Monitoring programmes for radioactivity in the environment and in biota are conducted in the Arctic, and particularly in Northwest Russia and adjoining waters.
2. Monitoring of environmental conditions surrounding aquaculture sites in order to assess the impact of farm.

3. Monitoring programmes for recipient waters for discharges of sewage, runoff from refuse dumps, tunnel drains, etc. These monitoring programmes may include analysis of hard and soft bottom organisms, heavy metals and organic compounds in sediment and biota, bacterial levels and changes in the intertidal floral and faunal communities.

Farming Surveys

Agriculture and environment (Resultatkontroll jordbruk – www.ssb.no)

The main aim of the report is to provide information to point out the main challenges, objectives and strategies related to environmental conservation and improvements within the agricultural sector in Norway. The report gives information related to nutrients runoff from agricultural activities, i.e. use of agricultural area and agricultural practices with regard to soil preparation and use of fertilisers. Data is given on percentage of land area in cereals, fruits and other crops other crops and set-aside, forage, bare fallow and grazing livestock. In addition, the report includes information on sales of pesticides and herbicides, on supply of nutrients to coastal areas, emissions of greenhouse gases, collection and recycling of waste, organic farming, and changes in land use and in agricultural landscape. The information given is to be used as direct feedback to both central and local agricultural authorities. Data is taken annually from each farm in Norway. The completion of this long survey has been required since 2001 (The Parliamentary White Paper no.8 (1999-2000). The report covers the whole country, with special emphasis on the region in Norway that is affected by The Declaration of Ministers in London 1987 concerning protection of the North Sea and the Nitrate Directive (91/676/EEC).

Pesticide Usage Survey (JOVA: overvåkning av pesticider)

All crop groups have been surveyed on an annually basis in Norway since 1995 (http://www.jordforsk.no/fagarealavr/pesticider.htm). In addition are different investigations of pesticides routinely done in rivers and streams, in drinking water wells, of groundwater, of water in ditches and in drainage basins.

Regional and local land use statistics (the 3Q-programme)

This involves a national monitoring programme providing statistics on landscape spatial structure, biodiversity, cultural monuments and public accessibility in agrarian cultural landscapes.

* A national landscape reference system that divides Norway into 45 landscape regions and 444 sub-regions. These are grouped into 10 major farming landscape regions.
* A mapping and database system for use in municipal biodiversity assessments.

This survey was developed by Norwegian Institute of Land Inventory (NIJOS) (http://www.nijos.no/English/index_e.htm) and provides baseline data and indicates changes in land use over a period of 5 years. The purpose is to identify indicators for agricultural land use, landscape resources, biodiversity and cultural monuments. Hence, this initiative provides land use statistics that can be used to evaluate agricultural policy instruments. The thematic landscape and biodiversity maps are especially suitable for use in municipal land use management. Associated software enables data storage, map production and the analysis of various landscape characteristics.

Soil databases

The Norwegian Centre for Soil and Environmental Research has developed a database that contains data from more than 400 000 samples from cultivated soils collected for fertiliser planning. This database can be applied within a broad field of agricultural and environmental research, e.g.:

* Occurrence of soil classes in different parts of Norway
* Nutrient state in cultivated soils; fertiliser and lime requirements
* Suitability for organic farming based on soil quality
* Factors influencing yield level and productivity in grain production
* Statistic for grain yields for different region, soil class and irrigation practice

In addition, are digital soil maps available for most of the grain cultivation areas in Norway. This data can be used to update soil series database with chemical analyses and derived properties, to develop information systems for management support, and to develop distributed information system to assist users to predict the consequences of alternative land use and management practice.

Other programs

Forestry -Tree Health

Norwegian Institute of Land Inventory (NIJOS) (http://www.nijos.no/English/index_e.htm) provides resource and environmental information relating to the forest areas in Norway. The institute compiles regional and national inventories of production capacity, forest resources and environmental status, and monitors changes of these parameters over time.

National surveillance system for microbial resistance (NORM).

The main goal with this survey is to obtain information on the use of antibiotics, the occurrence of resistant microbes in humans and animals and in food and the environment, the causes of the development and spread of antibiotics. The Royal Ministry of Health and Social Affair started this initiative in 1999. The University Hospital in Tromsø (http://www.unn.no/fagfolk/norm/norm/) is responsible for the human survey that involves collection of data from 20 laboratories from the whole country, while Norwegian Zoonosis centre (http://www.vetinst.no/zoo/index.asp?startID=&topExpand=&subExpand=&strUrl=1000591I) is responsible for the survey of resistance within animals.

Portugal

Currently in Portugal there aren't any GMO cultivated either in a commercial agricultural crops or in experimental trial sites. Since this situation persists in the last years, we don't have defined any environmental monitoring programs for surveillance of GMO. Consequently doesn't exist any monitoring program in progress.
However this issue are a concern of the Portuguese Competent Authority and we are expecting in a near future to begin the task of established an environmental monitoring program or surveillance of GMO.

Slovakia

Following the letter of Mr. Herve Martin I would like to briefly explain you the Slovak position in the field of post market monitoring of GMOs. At first - monitoring is in the beginning phase. Just before yesterday starts the PHARE-Twinning project on "Biosafety Monitoring System". Some of activities, based on actual acts, already exists: - monitoring of food, produced on GMO base, is in competency of Slovak State Veterinary and Food Authority (on the market - email to the director:stulc@svssr.sk) and Institute of Public Health (on community feeding), - monitoring of GM seed and feed is in competency of Central Control and Testing Institute of Agriculture (vitariusova@uksup.sk), - competent authority for monitoring, serving as the umbrella of mentioned monitoring mainly for other areas of using of LMOs, is the Slovak Environment Inspection, department of biosafety inspection (horecka@sizp.sk).
The main gap in the present we find is the unclear situation of the List of registered GM varieties of agricultural plants, and their validity in the member states. The planting of GM plants starts (in small areas) in this year in Slovakia and there is no system for their control in the country yet.
As far as I know no studies was made to data, it is one of goals of mentioned twinning project.

Sweden

Existing monitoring programs in Sweden

This is a short presentation of the different monitoring programs in Sweden that may be of interst for the general surveillance of genetically modified organisms. Only activities that are organised through any of the Swedish authorities have been included. There may also be activities in commercial collaborations and farmers organisations.

Environmental monitoring

In Sweden, the Swedish Environmental Protection Agency (EPA; Naturvårdsverket) functions as the co-ordinator for the environmental monitoring, but several other bodies perform the actual monitoring. At the link “Miljöövervakning” at http://www.naturvardsverket.se/ there is much information about this. However, it is in Swedish. The English version (http://www.internat.naturvardsverket.se/) contains less information. Some of the monitoring activities may be of interest for the general surveillance of GMOs, for example the following.

- *Soil and crops:* This program runs over a ten year period and has approximately 2 000 sampling areas all over Sweden. Different characteristics of the soil are observed such as mineral and organic content. In addition, 1 000 samples of crops are analysed.
- *Pesticides*: In this program four terrestrial areas and two streams are sampled for pesticides (herbicides, insecticides and fungicides) during the growth season each year. This is a continous program.
- *NILS program (National Inventory of Landscapes in Sweden)*: This program, that monitors the biodiversity, has 500 inventory areas (each 25 km^2) evenly spread over Sweden. The method is based on evaluation of air photographs as well as inventory of the areas. Each area will be re-visited every five years. Webpage http://www-nils.slu.se/ (in Swedish though). Contact nils@resgeom.slu.se

There are also other types of environmental monitoring activities that vary between the different counties (Sweden is divided into 21 counties, län), such as monitoring of certain insects or butterflies. The County Administration Boards (Länsstyrelserna) make a plan for the environmental monitoring that they judge are most desirable in their county. The EPA evaluates the plan and grants a budget for the monitoring.

Feed control

- *Feed control (Foderkontrollen)*: Organised by the Swedish Board of Agriculture. Monitors the quality of feed at feed producers and importers. Every feed producer is visited at least once per year, depending on the production volume. http://www.sjv.se/net/SJV/Startsida/%c4mnesomr%e5den/Djur+&+veterin%e4r/Foder/Foderkontrollen (in Swedish)
- *District Veterinarian Division (Distriktsveterinärerna)*: Organised by the Swedish Board of Agriculture. The District Veterinarians are avilable over the entire country and work with animal health and infectious disease control of animals for meat production as well as pet animals and horses. They also collect feed samples at farms for feed control. http://www.sjv.se/net/SJV/Startsida/%c4mnesomr%e5den/Djur+&+veterin%e4r/Distriktsveterin%e4rerna (in Swedish) http://www.sjv.se/net/SJV/Home/%c4mnesomr%e5den/Animal+health+&+welfare/District+Veterinarian+Department (in English, less information)
- *County Veterinarians (länsveterinärer)*: Perform hygien control in feed plants which include control of the documentation. The County Veterinarians are stationed in each county, and are appointed as Official Veterinarians by the Swedish Board of Agriculture.

Plant Protection Centres

The Plant Protection Centres (Växtskyddscentralerna) are organised under the Swedish Board of Agriculture.
http://www.sjv.se/net/SJV/Home/%c4mnesomr%e5den/Crops%2C+environment+&+water/Plant+Protection+Centres (English version).
The activity in these centres that may be of interest for the general surveillance of GMOs is mainly their contact with Advisory Officers (that work with pesticide advice to users). This means that the Plant Protection Centres are likely to get indications if resistant pests have developed. They played a central part in the discovery of an outbreak of insecticide resistance a few years ago.
They also have reference fields for prognoses of plant pathogens.

Appendices

1. "Coordinated environmental monitoring in Sweden". Folder from the Swedish EPA that describes the environmental monitoring year 2003.
2. "Samordnad miljöövervakning i Sverige". Similar to the folder above but for 2004 and unfortunately in Swedish. It may still be useful because it is probably possible to read the more recent figures in the Swedish version with the help of the English version, as the layout is the same.
3. "Nationell Inventering av Landskapet i Sverige". Folder that describes the NILS program. Unfortunately in Swedish.

Please find information on the Pollutant Release and Transfer Register at http://www.naturvardsverket.se/prtr/ and on the environmental surveillance (miljöövervakning) program at http://www.naturvardsverket.se/, this latter site is unfortunately only in Swedish.

UK

Existing Monitoring Programmes within the UK (which may be of use for the general surveillance of GMOs)

In response to your request of 3rd August 2004 please find a statement regarding the UK national monitoring programs.

Studies evaluating the use or adaptation of existing monitoring programs for the general surveillance of GMOs

We have recently commissioned a project entitled "Availability and Use of General Surveillance Information for Potential Changes Resulting from GM Crop Cultivation". This project is due for completion in December 2005 and will include an assessment of the potential use of existing monitoring schemes in the UK.

Available information on existing monitoring programmes in the UK
The following farm, forestry and environmental surveys and schemes which may be of use in the general surveillance of GM crops exist in the UK. This list is not complete and further details on the relevance and usefulness of each of these schemes will be provided in the report from the commissioned research project detailed above.

Biodiversity Monitoring
An outline of the UK's biodiversity monitoring schemes can be viewed at:
http://www.jncc.gov.uk/pdf/UK_biodiversity_monitoring_schemes_pdf
This site holds details of the types of organisms monitored and the frequency of the data collected. Many of the surveys are conducted by volunteers on an ad-hoc basis and most take place on non-agricultural land. However several of the schemes are long-running and have relevance to agricultural practise. A selection of these schemes, are outlined in the table below.

Organisms or Substances Monitored	Organisation	Area Covered	Periodicity
Terrestrial and freshwater species (except birds)	CEH (Centre of Ecology and Hydrology) Monkswood	Britain	Dated Repeated surveillance from local recorders (ad hoc)
Vascular Plants	Botanical Society of the British Isles(BSBI) and British Records Centre (BRC)	Britain and Ireland	Single survey may be repeated
Aquatic Plants and other selected species	Environment Agency (EA) and Scottish Environmental Protection Agency (SEPA)	Main Rivers throughout UK	Every 10 years
Invertebrates	Rothamsted Insect Survey	16 locations throughout UK	Daily during the "aphid season" since 1965
Butterflies	CEH BRC Butterfly Monitoring Scheme	UK (mainly nature reserves and protected sites)	Annually
Breeding Birds	British Trust for Ornithology(BTO)/ JNCC/RSPB Breeding Birds Survey	UK	Annually since 1994 (preceded by the Common Birds Census since 1962)
Mammals	Joint National Conservation Committee (JNCC)	UK	Planned annual surveys (currently pilot)

Multi-disciplinary National Surveys and Schemes (including soil and water quality)

Environmental Change Network
Since 1993 this has been the UK's long-term integrated ecosystem research network designed to aid detection, interpretation and forecasting of environmental change resulting from natural and human causes.

It is a multi-agency initiative with 54 terrestrial and freshwater sites making regular measurements of the main drivers of change e.g. climate, atmospheric chemistry , land use and ecosystem responses e.g. soil, flora, fauna and water quality.
Insect population abundance and small bird population changes are monitored. Information on the use of irrigation for potato crops is provided and the egg-laying dates of birds are also recorded.

Countryside Survey
This survey provides baseline data and indicates long-term changes in land use.
Initially carried out in 1978 and then followed by further surveys in 1984, 1996 and 2000. These surveys measure land cover, agricultural key habitats, freshwater habitats, uplands, bird populations and soil quality and pollution.
Land cover assessments are done on a 1 km^2 square scale. 569 of these squares and vegetation cover of higher plants (and selected lower plants) to species level was measured within 27 plots between 4 and 200 m^{-2} and $4m^2$ in each of the 1 km^2 squares. This compares to the 506 squares monitored in 1990. Agricultural key habitats (field margins and hedgerows) were also surveyed. Breeding bird populations were monitored in spring and summer of 2000 in at least 400 of the squares selected for the vegetation surveys. A bird/ habitat database has been set up to record the abundance of species in each habitat type. Soil quality and pollution was also monitored in the same locations sampled in the 1978 survey. Soil mesofauna were sampled using conventional approaches and microbial diversity using the BIOLOG approach. The loss on ignition and pH of the soil samples was also measured. Heavy metals analysis and analysis of samples for organic compounds also formed part of the work of this survey.

Farming Surveys

Agricultural Census
Data is taken annually from each farm in the UK (approximately 190 000 holdings. This requires farmers to set out what agricultural activity is happening on the land as of June each year. The completion of this long running survey has been legally required since 1979.

Farm Statistics from South East England (farmers income surveys)
This gives details of the price paid for feed, seed, fertilizers, crop protection, labour, machinery costs and fuel and oil. Also gives data on pecentage of land area in cereals, fruit and hops, other crops and set-aside, forage, bare fallow and grazing livestock (species and intensity/ 100Ha). This is part of the **Farm Business survey** which has been running since 1936. Each year it takes accounts data from approximately 2400 agricultural and horticultural businesses. Farmers participate in this scheme on a voluntary basis.

Countryside Stewardship Scheme Evaluation Project
Ecological Survey of areas on agricultural land. This scheme uses the Nature Conservancy Councils Phase I Habitat Survey and presence and type of arable field margins to assess the ecological value of hedgerows, land on the holding and individual features or species of conservation interest.

Plant Variety Monitoring
In common with all EC countries it is a legal requirement to ensure that all new plant varieties are distinct, uniform and stable and that all agricultural crops have a value for cultivation and use before national listing as certified seed. Trials are usually done for a 2 year period and the results are forwarded to the national list and seeds committee.

Pesticide Usage Survey
All crop groups are surveyed on a 4 yearly cycle in England and Wales (similar requirements exist in Scotland and this data is also held at York). Summary statistics are provided by active substance, crop group and times treated. (Pesticide Safety Directorate at the Central Science Laboratory)

Plant Health

Crop Monitor National Survey
Annual surveys of disease severity in winter wheat, winter barley and winter oilseed rape are co-ordinated by CSL (Central Science Laboratory).
For wheat 15 locations are used to provide weekly updates on disease severity (treated and untreated 5 different cultivars)
For winter oilseed rape (from September 2004) this is done at 5 locations. Monitoring is done on a weekly basis from date of sowing until December and then monthly until harvest.
Yellow rust monitoring and *Fusarium* monitoring are done in untreated crops containing a variety of cultivars each with different resistance characteristics (so that pathogen race can be identified) at 10 sites around the UK.

Plant Health Inspections

Farmers are required to notify the plant health authority of 470 key pests and diseases. Inspections of growers premises are carried out annually.

Forestry

Tree Health

The Forestry Commission Plant Health Service carries out annual inspections of protected zones (40 survey plots in the UK) to ensure that no new pests have been introduced and to establish the extent of spread of endemic pests.

Livestock Health

Animal Disease Monitoring

The VLA (Veterinary Laboratories Agency) monitors endemic diseases in livestock and produces monthly national endemic disease reports and annual veterinary investigation diagnosis analysis reports for the AHWDG (Animal Health and Welfare Directorate General) of Defra. A database system (RADAR) is currently being set up to hold information on animal diseases, disease control and animal populations in the UK and will be available for research purposes.

Bee Health

An apiary inspection programme exists in England and Wales, inspections are carried out when a concern about bee health arises. Bee keepers inform inspectors of problems with bee health and records on pests and diseases are held. Honey monitoring for chemical residues has been done annually since 2003 by the national surveillance scheme.

Farming and Air Quality

Pollen Monitoring

The national pollen research unit collate data from a network of 33 pollen monitoring sites around the UK taking daily airborne pollen samples.

GM Release Monitoring

All consents for experimental release issued under Part B of directive 2001/18 EC require the applicant to monitor the release site for presence of GM material in the years following the initial release. These records are held by the UK competent authority for 2001/18 EC.

Comments on the Use and Possible Adaptation of Existing Monitoring Schemes

Wide ranges of monitoring programs with relevance to the general surveillance of the impact of GM crops are carried out in the UK. Several of the large-scale monitoring schemes are long term and could provide good baseline data for ongoing general surveillance schemes. There are also various annual monitoring programmes such as the agricultural census and the farm business survey which could be adapted to gain further information of relevance to GM surveillance. Although many biodiversity monitoring programs exist most of the schemes are operated by volunteers and the quality and quantity of information may not be adequate for rigorous scientific investigation. Integration of reliable environmental data with data on farming practices into a single database to enable scientific investigation is essential in developing a robust surveillance scheme capable of detecting both short and long-term changes in farming management. The research project recently commissioned will provide information about the feasibility of this approach in the UK and highlight any deficiencies in the monitoring strategies currently employed.