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Good farming practice - definitions, implementation, experiences :

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Annex II G: Germany; Country Report and Contributed Papers

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Country Report Germany

Angela Bergschmidt, FAL Braunschweig, 2003

The agricultural sector and its negative environmental impacts in Germany

About 50 % of the German land surface is agricultural utilised area. A high share of the German pig and poultry production is concentrated in the north-west of Germany, where also dairy and beef production are intensive. This causes high regional nutrient surpluses with resulting environmental problems such as groundwater pollution and high ammonia emissions. In contrast animal numbers in the eastern federal states declined sharply after reunification of the two states of Germany, reaching today very low regional densities of livestock production.

The main negative environmental impacts ascribed to agriculture in Germany are:

- ground water pollution by nitrates and pesticides
- surface water pollution by nutrients and pesticides, as well as structural impacts of intensive land use adjacent to water streams and lakes
- air pollution by ammonia and greenhouse gas emissions
- decline of species and biotope variety and increasing uniformity of landscapes due to intensive agricultural land use and the elimination of landscape elements

In Germany, agriculture contributes to about 66 % of nitrogen and 56 % of phosphor immissions into the surface water (Böhm et al. 2002). About 90 % of ammonia emissions and 7-8 % of greenhouse gas emissions are caused by agricultural production (Baldock et. al. 2003).

Environmental Legislation and GFP in Germany

Legislative competence of the federation and the federal states

The German law consists of framework legislation as well as exclusive and competing legislation. The framework legislation describes the fundamentals of a law (i.e. Water Management Act, *Wasserhaushaltsgesetz*, Nature Protection Law, *Bundesnaturschutzgesetz*) which has to be enacted by the federal states (*Länder*) through specific laws (*Landeswassergesetze*, *Landesnaturschutzgesetze*). Exclusive legislation is a federal law legal

in the federal states without further specification at the *Länder*-level (Federal Fertiliser Act and Fertiliser Ordinance, *Düngeverordnung*). Competing legislation is enacted by the federal states when the federation does not use its legislative competence. This is the case with respect to some aspects of plant protection against diseases and varmint (Knickel et. al. 2001, p. 93).

The German law distinguishes between criminal acts and administrative offences. Criminal acts are severe torts like surface- and groundwater pollution or illegal waste disposal. Administrative offences are "lesser" torts like spreading manure during the winter month or spreading more than 170/210 kg N ha⁻¹ yr⁻¹ of livestock manure. The prosecution of administrative offences is carried out by the institutions in charge of the control (mainly Regional Offices and Regional District Offices). These Offices pronounce rulings (*Anordnungen*) admonishments, impose admonishment fines (*Verwarnungsgelder*) or administrative offence fines (*Bussgelder*) (fines are usually low¹ i.e. between 25 and 150 • in Baden-Württemberg if the field sprayer does not have an inspection certificate). If criminal acts are detected, the case is forwarded to the prosecuting authorities who accuse according to the Environmental criminal law.

Environmental legislation relevant for the agricultural sector

There is no single document combining all relevant agri-environmental regulations but a wide range of environmental and agricultural legislation which has or can have implications for GFP. A selection of the respective national laws and ordinances in Table 1 (for a more exhaustive list and description see: Betriebswirtschaftliche Mitteilungen 2001) shows the amplitude of legislation containing elements which contribute to the definition of GFP but also the restricted coverage with respect to the control of GFP.

Table 1: Environmental legislation relevant for agriculture

<u>Agricultural Production Facilities</u>		<u>GFP control</u>
Fertilisation	Fertiliser Law (<i>Düngemittelgesetz</i>)	
	Fertiliser Ordinance (<i>Düngemittelverordnung</i>)	
	Fertilisation Ordinance (<i>Düngeverordnung</i>)	✓
Plant Protection	Federal Plant Protection Act (<i>Pflanzenschutzgesetz</i>)	✓
	Pesticides Ordinance (<i>Pflanzenschutzmittelverordnung</i>)	✓
	Use of Pesticides Ordinance (<i>Pflanzenschutz-Anwendungsverordnung</i>)	✓
	Pesticides Training Ordinance (<i>Pflanzenschutz-Sachkundeverordnung</i>)	✓

¹ Although the Fertilisation Ordinance allows for fines up to 15.000 • (Barunke, 2002, p. 93)

Construction	Bee Protection Ordinance (<i>Bienenschutzverordnung</i>) ✓
	Regional Development Law (<i>Raumordnungsgesetz</i>)
	Construction Codes (<i>Baugesetzbuch</i>)
	Law on Environmental Impact Assessment (<i>Gesetz über die Umweltverträglichkeitsprüfung</i>)
Environmental goods	
Air Quality	Law on Immission Protection (<i>Bundesimmissionsschutzgesetz - BImSchG</i>)
	Ordinances on Immission Protection 1, 4, 11 (<i>Bundesimmissionsschutzverordnung - BImSchV</i>)
	Technical instructions on air-pollution prevention (<i>Technische Anleitung zur Reinhaltung der Luft - TA-Luft</i>)
Water Quality and Use	Groundwater Ordinance (<i>Grundwasserverordnung</i>)
	Drinking Water Ordinance (<i>Trinkwasserverordnung</i>)
	Water Supply Law (<i>Wasserhaushaltsgesetz</i>)
Recycling and Waste Management	Recycling Management and Waste Law (<i>Kreislaufwirtschafts- und Abfallgesetz</i>)
	Sewage Sludge Ordinance (<i>Klärschlammverordnung</i>)
	Ordinance on Biowastes (<i>Bioabfallverordnung</i>)
Soil Protection	Soil Protection Law § 17 (<i>Bundesbodenschutzgesetz</i>)
	Soil Protection and Legacy Ordinance (<i>Bundesbodenschutz- und Altlastenverordnung</i>)
Nature Protection	Nature Protection Law (<i>Bundesnaturschutzgesetz</i>)
	Protection of Species Ordinance (<i>Bundesartenschutzverordnung</i>)

Definition, Implementation and Control of GFP in Germany

In Germany codes of good farming practice are defined for agriculture in general but also for specific activities (plant protection, fertilisation) or media (soil protection). Codes of GFP can be set up by the state (BMVEL 1998) or its agencies (Bundesamt für Naturschutz 2001) the federal states or by advisory services, research agencies (BBA 1999) as well as farmers- (Deutscher Bauernverband 2000) or environmental lobby (NABU 1999). They can either be legally binding or formulated as recommendations or requirements (even if published by the national government). There is thus a wide range of codes of "Good Farming Practices" which are not necessarily legally binding for the farmer.

The definition of GFP in the „Annual Reports“ according to Reg. (EC) 963/2001 for the implementation of Reg. (EC) 1259/1999 is based on the legislation on the use of fertilisers and pesticides. The relevant legislation is the Federal Fertiliser Act 1989 and subsequent Ordinance on Fertilisation 1996 and the Regulation on Plant Protection Products and Plant Protection Equipment 1998 and subsequent Pesticides Ordinances (Use of Pesticides Ordinance, Pesticides Training Ordinance and Bee Protection Ordinance). For

these eight standard indicators at farm level are selected² and used for control of compliance.

In the definitions of GFP in the Rural Development Plans according to Reg. (EC) 1257/1999 each federal state can present its own selection of criteria. Some *Länder* stick to the GFP aspects of fertilisation and plant protection (i.e. NRW) while others start on a broader base and include aspects of soil and nature conservation (i.e. Bavaria). In contrast to this variety in the definition of GFP the control of its implementation is generally carried out using a set of six indicators on which the federal states have agreed.

In the following paragraphs the environmental legislation relevant for the definition of GFP criteria on EU, national and if relevant at the federal state level as well as the respective indicators for the control are described in more detail.

A: The legal background of Good Farming Practice in Germany

1 Use (storage) of fertilisers, slurry and manure

EU and National Law

The most important EU legislation with respect to the use and storage of fertilisers, slurry and manure is the Nitrate Directive³ In implementing the Nitrate Directive Germany has

² Out of a set of 15 Indicators used for on farm controls of the compliance with the environmental legislation in Germany (*Fachrechtskontrolle*).

³ Regulation on waste management in the EU is provided by the Waste Framework Directive (75/442/EEG). The German application is the 'Law concerning Recycling and Waste' (*Kreislaufwirtschafts- und Abfallgesetz*) and several edicts as well as specified laws of the federal states. The purpose of the 'Law Concerning Recycling and Waste' is the support of recycling to protect natural resources and the security of ecologically harmless disposal of wastes. The agricultural utilisation of organic wastes is important in terms of recycling nutrients but this law also regulates - in combination

opted for 100% Nitrate Vulnerable Zone designation. Thus the relevant codes of GFP and additional measures are mandatory across the whole territory.

Additionally Water Protection Areas exist in all federal states and are subject to additional environmental legislation. Using the example of Schleswig-Holstein the main provisions of this legislation are described. Outside the requirements of good agricultural practice within the environmental legislation there are also systems of co-operative agreements between farmers and water suppliers. The agreements are usually between a number of farmers and an individual water supply companies (Baldock et. al. 2003). Because of their site-specific design they will not be included in this report.

with the 'Sewage Sludge Ordinance' (*Klärschlammverordnung*) - the protection of the soil against harmful substances (Baldock et. al. 2003).

1.1 Nitrate (+ general rules of fertilisation) - Implementation of the Nitrate Directive in Germany

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
<p>Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrate from agricultural sources ("Nitrate Directive") including Annex II and III of the Directive</p> <p>Member states may either implement action programmes in designated vulnerable zones for or throughout the national territory</p> <p>Member States shall:</p> <ul style="list-style-type: none"> – establish a code or codes of good agricultural practice, to be implemented by farmers on a voluntary basis, which should contain provisions covering at least the items mentioned in Annex II – establish action programmes which shall consist of: <ul style="list-style-type: none"> – the measures in Annex III; – those measures which have been prescribed in the code(s) of good agricultural practice except those which have been superseded by the measures in Annex III. 	<p>Fertilisation Ordinance: Regulation on the principles of good farming practice of fertilisation ("Düngerverordnung")</p> <p>The regulation is valid throughout the national territory and serves as "action programme"</p> <p>The main aim of the regulation is to ensure that fertiliser is applied:</p> <ul style="list-style-type: none"> • such as the plant can use the nutrients • nutrient losses to the environment are minimised <p>The regulation covers nutrient supply with nitrates, phosphorous and potassium</p>	<p>Wasserhaushaltsgesetz §19, Landeswassergesetz § 4 (i.e. Schleswig-Holstein)</p> <p>The respective regulations of the Länder are valid in water protection areas</p> <p>Water protection areas have three zones (I, II, III) with different degrees of restrictions for agricultural use (in zone I farming is not allowed)</p>			

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
CODE(S) OF GOOD AGRICULTURAL PRACTICE (ANNEX II):					
1. periods when the land application of fertiliser is inappropriate;	-				
2. the land application of fertiliser to steeply sloping ground;	-		Control of prevention of direct entry of fertiliser into water-courses or avulsion to neighbouring fields	Control of prevention of direct entry of fertiliser into water-courses.	
3. the land application of fertiliser to water-saturated, flooded, frozen or snow-covered ground;	AP (in the action programme)				
4. the conditions for application of fertiliser near water courses;	Adequate distance to the watercourse has to be kept.				
5. the capacity and construction of storage vessels for livestock manures and effluents from stored plant materials such as silage;					
6. procedures for the application, including rate and uniformity of spreading, of both chemical fertiliser and livestock manure	<ul style="list-style-type: none"> Equipment for spreading fertiliser and livestock manure has to comply to the acknowledged rules of technology. spreading "close to the soil" ("<i>bo-dennahe Ausbringung</i>") of livestock manure immediate incorporation of livestock manure 		Control of immediate incorporation of livestock manure and liquid sewage sludge on uncultivated arable land		Control of immediate incorporation of livestock manure and liquid sewage sludge on uncultivated arable land.

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
7. land use management, including the use of crop rotation systems and the proportion of the land area devoted to permanent crops relative to annual fallow crops;	If no arable crop is sown in autumn, the nitrogen in the soil should be used by intermediate (cover) crops				
8. the maintenance of a minimum quantity of vegetation cover during (rainy) periods	<i>(regulated in the Germany through the soil protection act- Bundesbodenschutzgesetz)</i>				
9. the establishment of fertiliser plans on a farm-by-farm basis and the keeping of records on fertiliser use;	Calculation of fertiliser plans for each crop and yearly farmgate-balance	Records on the use of fertiliser for each field.	Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances	Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances.	Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances.
	Records, including soil tests have to be retained for 9 years		Control of compliance with the retaining period of the records.		
10. the prevention of water pollution from run-off and the downward water movement in irrigation systems.	-				

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
MEASURES TO BE INCLUDED IN ACTION PROGRAMMES (ANNEX III)					
1. periods when the application of certain types of fertiliser is prohibited;	15. 11.-15.1.	15.09. - 31.01. no application of nitrogen fertiliser (dung 15.09 - 30.11) 01.07. - 31.01 no application of nitrogen fertiliser on moorsoil	Control of the compliance with the periods when the application of manure is prohibited	Control of the compliance with the periods when the application of manure is prohibited	
	Fertiliser can only be applied after the expected times of flooding to agricultural land frequently flooded or at risk of flooding.				
2. specification of the capacity of storage vessels for livestock manure ,					

⁴ this capacity must exceed that required for storage throughout the longest period during which application is prohibited except where it can be demonstrated to the competent authority that any quantity of manure in excess of the actual storage capacity will be disposed of in a manner which will not cause harm to the environment;

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
3. limitation of the application of fertilisers taking into account:					
(a) soil conditions, soil type and slope;	Fertiliser may only be applied when the soil is absorptive. The soil is not absorptive if watersaturated, deepfrozen or snowcovered.		Control of application to absorptive soil.		
(b) climatic conditions, rainfall and irrigation;	To avoid ammonia emissions from animal manure and sewage sludge during application temperature and insolation should be taken into account.				
(c) land use and agricultural practices, including crop rotation systems; and to be balanced on a balance between:					
(i) the foreseeable nitrogen requirements of the crops, and	The nitrogen requirements of the crops for the expected harvested quantity and quality.				
(ii) the nitrogen supply to the crops from the soil and from fertilisation corresponding to:					

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
- the amount of nitrogen present in the soil at the moment when the crop starts to use it to a significant degree (outstanding amounts at the end of winter), - the supply of nitrogen through the net mineralization of the reserves of organic nitrogen in the soil,	Soil tests on mineral nitrogen have to be carried out on a yearly basis, the respective information can be substituted by recommendations of local advisory services.		Control of the soil tests or the local recommendations.	Control of the soil tests or the local recommendations.	Control of the soil tests or the local recommendations.
- additions of nitrogen compounds from livestock manure,	The quantity of nitrogen in livestock manure has to be determined either through testing or calculated using recognised recommendations of an official agency (ammonia losses of 10 % for liquid manure and 25 % for dung during storage and 20 % during spreading can be subtracted from manure for the calculation of the nitrogen content of livestock manure) ⁵ .		Control of determination of the quantity of nitrogen in livestock manure.		
- additions of nitrogen compounds from chemical and other fertilisers.					

⁵ these nitrogen losses were considered too high by the European Commission, Germany will have to correct the accountable "potential losses"

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
These measures will ensure that the amount of livestock manure applied shall not exceed 170 kg N per hectare. ⁶	170 kg N/ha on arable crops 210 kg N/ha on grassland	Maximum amounts of nitrogen fertilizer: 140 kg N on grassland 100 kg N/ha on moor-grassland For arable crops a special restrictive calculation of the nitrogen requirements is used.	Control of the maximum amount of livestock manure applied to arable land and grassland	Control of the maximum amount of livestock manure applied to arable land and grassland.	
	A maximum of 40 kg NH ₄ -N/ha or 80 kg N/ha in liquid fertiliser or manure is to be applied in autumn after harvest.		Control of the maximum N allowed in autumn after harvest with liquid fertilizer or manure		

⁶ However:

- (a) for the first four years action programme Member States may allow an amount of manure containing up to 210 kg N;
- (b) Member States may fix different amounts from those referred to above. These amounts must be justified on the basis of objectives criteria, for example:
 - long growing seasons,
 - crops with high nitrogen uptake,
 - high net precipitation in the vulnerable zone,
 - soils with exceptionally high denitrification capacity.

EU-LAW	NATIONAL LAW	WATER PROTECTION AREAS (EXAMPLE) – REGIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
		Storage of fertiliser and manure only in closed, leak-proof buildings (zone III) Storage of mineral fertiliser not allo- wed (zone II)			
		Animal grazing not allowed (zone II)			
		No fertilisation allowed (zone I)			

The Fertiliser Ordinance does not provide for specifications of the capacity of storage vessels for livestock manure. Indirectly these can be deduced from the period when the application of manure is prohibited (three month). Livestock farms above a certain size, which need a building construction under the terms of the 'National Immission Protection Law' (*Bundesimmissionsschutzgesetz - BImSchG*) (i.e. with 250 or more cows or 1500 fattening pigs or 15000 laying hens) are according to the 'technical instructions on air-pollution prevention' (*TA-Luft*⁷) required to have a storage volume for manure or slurry of 6 month.

While manure e.g. from German turkeys, imported from another farm, is in terms of national law a recognised fertiliser, imported manure is hazardous waste according the definition of the Basel Convention. It is legal to use it as fertiliser but the storage on agricultural land is prohibited because of the definition as 'hazardous waste'. Solid manure can be stored for short time in the farm area without exact prescription in the water law (Baldock et. al. 2003).

1.2 Potassium and Phosphate

No European legislation covers codes of GFP with respect to Phosphate and Potassium fertilisation. In Germany most aspects of GFP with respect to Potassium and Phosphate fertilisation are covered at the national level by the fertilisation ordinance described in detail in paragraph X. Additionally the Water Protection Areas and the co-operative agreements between farmers and water suppliers can also be of relevance.

⁷ Technische Anleitung zur Reinhaltung der Luft vom 24. Juli 2002
(<http://www.bmu.de/download/dateien/taluft.pdf>)

NATIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
Fertilisation Ordinance: Regulation on the principles of good farming practice of fertilisation ("Düngeverordnung")			
see above			
Soil test for Potassium and Phosphate have to be carried out once in every crop rotation but at minimum every 6 years. On extensive permanent grassland every 9 years	Control of the soil tests.	Control of the soil tests	Control of the soil tests
The quantity of phosphate and potassium in livestock manure has to be determined (either through testing or calculated using recognised recommendations of an official agency).	Control of determination of the quantity of phosphate and potassium in livestock manure.		
Calculation of fertiliser plans and farmgate-balances every 3 years.	Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances and their results	Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances and their results	Control of fertiliser plans and nutrient balances
Reduced fertilisation at the level of plant withdrawal is required if the soil has high P and K contents ⁸ .	Control of restricted application of animal manure on soil with high P and K contents		

2 Pesticide Use

In the European Union codes of GFP with regard to pesticide use at the farm level are set at Member State level. Binding standards on the accreditation of pesticides (Directive 91/414), maximum acceptable concentrations of pesticides in drinking water (Directive 98/83), maximum recommended levels of pesticide residues in food and animal feed and bans on certain highly toxic ingredients (Directive 79/117) are determined at EU level (Eaton, 2003).

⁸ Until the year 2004 exemptions to the rule can be accepted if no harm to water quality can be expected and if the farm would suffer "unreasonable hardship"

According to the Federal Plant Protection Act, pesticides have to be used in conformity with the principles of GFP (BMVEL 1998). These principles are abundant but for most parts not binding. General codes of GFP are for instance:

- all plant protection measures are to be carried out site-, plant- and situation-specific and the use of pesticides limited to the necessary extent
- established non-chemical measures are to be used
- preventative measures should be applied

The codes of GFP also include the consideration of the principles of integrated plant protection (i.e. assessment and evaluation of infestation and damage, choice of suitable control measures, application of non-chemical measures, efficiency reviews and documentation of measures) as well as the protection of surface- and groundwater (i.e. washing of pesticide sprayers and tanks on the farm yards is not allowed because it is an important source of surface water pollution with pesticides).

Most of the more specific aspects of GFP are included in the accreditation process. I.e. for some pesticides a 10 m wide plant-covered strip to surface water is required when spraying slopes steeper than 2 % (Bach et. al. 1999, p. 34). Accreditation for a pesticide is since June 2001 only given for one or several specified agricultural crops (*Indikationszulassung*). Some pesticides are accredited under the condition that a specific distance has to be maintained to watercourses and non-target areas and/or that driftage reducing equipment is used. Distances vary not only according to the pesticide and the equipment used but also with respect to the regional endowment with landscape elements⁹ (hedges etc.) the character (path, street, biotope) and size (> 3 m width) of the non-target area.

⁹ If a region has a lot of landscape elements the spraying distance is less than in regions where there are very little elements.

NATIONAL LAW	NATIONAL CONTROL (FINED)	REG. 1259/1999	REG. 1257/1999
Federal Plant Protection Act (<i>Pflanzenschutzgesetz</i>)	Control of the compliance with the interdiction of the application of pesticides on areas not used for agriculture, forest or gardening or in direct vicinity to watercourses		
Pesticides Ordinances (<i>Pflanzenschutzmittelverordnung</i>)	Control of the inspection certificate of field sprayers	Control of the inspection certificate of field sprayers	Control of the inspection certificate of field sprayers
Ordinance on the Use of Pesticides (<i>Pflanzenschutz-Anwendungsverordnung</i>)	Control of the compliance with the restrictions and interdictions for the application of certain pesticide ingredients and for specific sites (including the provisions of the Bee Protection Ordinance)	Control of the compliance with the restrictions and interdictions for the application of certain pesticide ingredients and for specific sites (including the provisions of the Bee Protection Ordinance)	
Pesticides Training Ordinance (<i>Pflanzenschutz-Sachkundeverordnung</i>)	Control of plant protection expert knowledge certificate (<i>Sachkundennachweis</i>)	Control of plant protection expert knowledge certificate (<i>Sachkundennachweis</i>)	Control of plant protection expert knowledge certificate (<i>Sachkundennachweis</i>)
Bee Protection Ordinance (<i>Bienenschutzverordnung</i>)	see above	see above	

Many changes have been initiated to the GFP of plant protection in the last years. In 1999 the distance rules have been revised 5 times, 2001 brought the *Indikationszulassung* and the special rule with respect to the regional endowment with landscape elements and flexible distance rules have been introduced for watercourses in 2002 (Habermeyer 2003). While acceptance is high with respect to the equipment, the frequent modifications are

seen to be one reason for the low acceptability when it comes to maintaining the required distances (BBA, ed.2002, p. 62).

3 Water Use (Irrigation)

Environmental legislation at EU level does not provide for regulations of water use. In Germany the extraction of water (i.e. for irrigation) from watercourses or groundwater require a permission according to the Water Supply Law (*Wasserhaushaltsgesetz*) which is implemented through the Water Laws of the federal states (*Landeswassergesetze*).

4 Soil Conservation

4.1 Soil cover, tillage and cropping patterns

See. 4.3

4.2 Use (storage) of sewage sludge and compost (see also 1)

On the EU level use and storage of sewage sludge and compost are subject of Directive 86/278/EEC. In Germany the Directive is implemented by the Sewage Sludge Ordinance (*Klärschlammverordnung*) and the Ordinance on Biowastes - (*Bioabfallverordnung - BioAbfV*) and the respective regulations of the federal states. These do not use the term GFP explicitly but do contain equivalent criteria.

In case of the Sewage Sludge Ordinance these include

- provisions for the maximum nutrient content (for Phosphorous, Potassium, Nitrate and Magnesium) and maximum heavy metal content of the soil on which sewage sludge can be applied,
- max. heavymetal content of sewage sludge limited
- crops on which the application is banned (vegetables),
- the total amount of biowastes (dry matter) applied per hectare within a period of three years shall not exceed 5 tonnes
- rules of documentation

In the Ordinance on Biowastes the main requirements concern:

- the total amount of biowastes (dry matter) applied per hectare within a period of three years which shall not exceed 20 tonnes

- **biowastes applied on forage or vegetable crops which shall be worked into the surface prior to the commencement of cropping**
- the interdiction to apply biowaste on the same plot of land as sewage sludge;
- rules of documentation

Non compliance is an administrative offence.

4.3 Others (erosion, compaction, salinisation etc.)

Codes of GFP with regard to erosion and compaction are set at Member State level in the European Union. In Germany the Soil Protection Law (*Bundesbodenschutzgesetz*) defines principles of GFP. These have been substantiated by a common working group of representatives at the national and federal states level (BMVEL 2001). No quantitative criteria have been set up, no indicators for control have been defined nor any penalties laid down.

GFP to avoid compaction comprises:

- use and development of technical solutions
 - regulation of the tire compression
 - enlargement of the 'foodprint' of tyres"
- adaptation of working methods, i.e.:
 - "onland" tilling
 - merging of working processes (i.e. land management and sowing)
- improvement of the carrying capacity of the soil
 - conservation tillage
 - continuous soil cover
- limitation of the mechanical strain on the soil

GFP to avoid erosion comprises:

- continuous soil cover
- lanes parallel to the slope
- avoid or eliminate compaction which inhibits water infiltration
- promote biological activity (stabilises soil aggregates)
- conservation tillage
- strips of grass or hedges parallel to the slope

5 Animal housing / animal husbandry (e.g. in farms with large stock of animals; regional planning and immission oriented law)

see 1.1

6 Landscape and Biodiversity (e.g. regarding the conversion of grassland into arable land, conversion of habitats into farm land, drainage of wetlands)

On the European level the Habitats Directive (92/43/EEC on the conservation of natural habitats and of wild flora and fauna) requires that the favourable conservation status of sites designated for habitats and species is achieved and maintained. The objectives for Natura 2000 sites take priority over the more general objectives of the water protection legislation. Whatever action is necessary to protect such sites from diffuse agricultural pollution should be undertaken in implementing the habitats and birds (79/409/EEC on the conservation of wild birds) Directives (Eaton, 2003).

The new Nature Protection Law (*Bundesnaturschutzgesetz*) has been adopted as a framework law in March 2002 and has to be implemented in the legislation of the federal states within a period of three years. It provides for a series of principles of GFP, some of which are characterised by a lack of preciseness:

- farming has to happen in consideration of the location and safeguard the sustainable fertility of the soil and lasting usability of the acreage
- Avoidable adverse effects on existing biotopes are to be omitted
- Animal production has to be in due proportion to plant production and adverse effects on the environment to be avoided
- The natural endowment of the farmland (soil, water, flora, fauna) may not be impaired more than necessary to obtain a sustainable harvest

More guidance is given by criteria such as:

- Landscape elements essential for linking-up biotopes are to be maintained and if possible increased
- On slopes which are susceptible to erosion, in flood plains, on moors and sites with a high groundwater level it is not allowed to convert grassland into arable land
- Documentation on plant protection measures and fertiliser use has to be carried out for each plot according to the respective agri-environmental laws (*Fachrecht*)

At the moment the federal nature protection laws (*Landesnaturschutzgesetze*) based on the national Nature Protection Law (amended in 1998) are still in force. In this version of

the law the agricultural land use is in general not considered as being in conflict with the goals of nature protection if carried out according to the codes of GFP as laid down in the special agricultural law (*Fachrecht*). The destruction of biotopes or specific landscape elements (i.e. *Knicks*-typical hedgerows in Schleswig Holstein) is usually fined (*Landesnaturschutzgesetz Schleswig-Holstein*) but the respective controls are not carried out in the framework of GFP.

7 "Farm Management" (e. g. farm management plans / nutrient plans etc.)

8 others

There is a wide range of EU legislation aimed at the protection of water from pollution such as the groundwater Directive (Dir 80/68/EC), freshwater for fish and shellfish Directives (Dir 78/659/EC and Dir 79/923/EC), bathing water Directive (Dir 76/160/EC) and the water framework Directive (Dir 2000/60/EC) but no specific requirements for farmers are laid down in these Directives. The legislation's primary aim is the maintenance of certain water quality targets for a range of pollutants while a considerable degree of flexibility is left to each Member State to decide how to achieve these standards (Eaton, 2003).

In Germany the Water Supply Law (*Wasserhaushaltsgesetz*) which is implemented through the Water Laws of the federal states (*Landeswassergesetze*) does not only provide for the legislative framework with respect to water use but also defines criteria for water quality. For agriculture especially the discharge of substances into surface and groundwater is of relevance (i.e. the cleaning water of the milking machines or pesticide sprays).

B: Monitoring, control and enforcement (Table B)

Area	Specific questions	
<p>Changes of the legal framework</p>	<p>Short description of changes of environmental legislation (<i>before and after</i> Agenda 2000)</p>	<p>The definition of GFP at the federal- and <i>Länder</i> level is based on the legislation on the use of fertilisers and pesticides which was in place before Agenda 2000 (the Federal Fertiliser Act of 1989 and subsequent Ordinance on Fertilisation 1996, the Regulation on Plant Protection Products and Plant Protection Equipment 1998 and subsequent Pesticides Ordinances: Use of Pesticides Ordinance, Pesticides Training Ordinance and Bee Protection Ordinance).</p> <p>The control of GFP has been increased due to the requirements of Reg. (EC) 1257/99 (control of 5 % of the beneficiaries) and communication and information fostered between the federal states in the preparation of a common report to the commission according to Reg. (EC) 963/2001 on the implementation of Reg. (EC) 1259/1999.</p>
<p>Monitoring and control: Institutions</p>	<p>Who is realising risk analysis, decision on and accomplishment of farm control (Departments involved: agricultural, environment, water ...), are there connections to technical advice and other functions?</p>	
	<p>Reg. (EC) 1259/1999 and national law</p>	<p>Generally the execution and control of the Fertiliser - and Plant Protection Law is carried out by institutions of the <i>Länder</i>.</p> <p>I.e. in Bavaria the execution of Plant Protection Law (<i>Pflanzenschutzrecht</i>) and Fertiliser Law (<i>Düngemittelrecht</i>) is carried out by:</p> <ul style="list-style-type: none"> • the Regional Office for Soil and Husbandry (<i>Bayerische Landesanstalt für Bodenkultur und Pflanzenbau</i>) • the Office for Agriculture and Nutrition (<i>Ämter für Landwirtschaft und Ernährung</i>)

	<p>Reg. (EC) 1257/1999 and Reg (EC) Nr. 1750/1999 or Reg (EC) Nr. 445/2002</p>	<ul style="list-style-type: none"> Rural District Office (<i>Landratsämter</i>) (only Plant Protection Law) <p>The control of GFP according to Reg. (EC) 1257/1999 is carried out in addition to the general control of the Fertiliser - and Plant Protection Law (<i>Fachrechtskontrolle</i>) by the IACS (Integrated Administration and Control System). IACS uses the Indicators which the federal states have agreed upon.</p> <p>If a violation is ascertained, the institutions mentioned above are contacted for an additional visit of the farm and an in depth control. While originally a premia-reduction would only be imposed after the <i>Fachrechtskontrolle</i> confirms the violation of GFP this procedure has been modified in Lower Saxony after the European Commission had criticised this procedure.</p>
<p>Procedures and Implementation</p>	<p><i>Reg. (EC) 1259/1999 and national law</i></p> <ol style="list-style-type: none"> Frequency of control / risk analysis Number of farms controlled, % of all farms Random sample inspections or inspections for specific reasons (e.g. due to suspicion or due to complaint) Indicators for control (which indicators, appropriate for control, possibility to detect breaching) Statistics on breaching and sanctions 	<p>There is no officially published statistic on controls of GFP and no national information available on the control of the <i>Fachrecht</i> as a whole.</p> <p>According to Reg. (EC) 963/2001 on the implementation of Reg. (EC) 1259/1999, the Member States are required to provide the European Commission with information on the control of GFP. To this aim the federal states have agreed on indicators for which they provide information on the number of farms/acreage controlled, the number of breaches the number of fines imposed and the average extend of the fine.</p> <ol style="list-style-type: none"> Controls under the <i>Fachrecht</i> are generally not carried out on a broad scale, in some federal states only due to suspicion or complaint. Some federal states additionally conduct random sample inspections for some indicators, others predetermine a control sample through risk assessment (for example North-Rhine-Westphalia [Eisele, 2003]). In the average of the years 2000-2002 the following numbers of controls were carried out in Germany: <ul style="list-style-type: none"> a) Control of prevention of direct entry of fertiliser into watercourses (1.414 farms) b) Control of the compliance with the periods when the application of manure is prohibited (981 farms) c) Control of the maximum amount of livestock manure applied to arable land and grassland (3.446 farms)

		<p>d) Control of the soil tests or the local recommendations (10.258 farms)</p> <p>e) Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances (6.904 farms)</p> <p>f) Control of the compliance with the restrictions and interdictions for the application of certain pesticide ingredients and for specific sites (4.142 farms)</p> <p>g) Control of plant protection expert knowledge certificate (3.941 farms)</p> <p>h) Control of the inspection certificate of field sprayers (5.963 farms)</p> <p>2. The declaration on the control according to Reg. (EC) 963/2001 does not allow for a precise assessment of the total number of farms controlled. The number of farms controlled is given separately for the different criteria, as several criteria are likely to have been controlled on one farm, summing up these numbers (~ 37.000 in the average of the years 2000-2002) will result in an overestimation of all farms controlled. In any case, less than one percent of all farms in Germany (~ 454.000) have been subject to the controls of the GFP-indicators chosen for the report according to Reg. (EC) 963/2001 in the years 2000 and 2002.</p> <p>There is a high degree of variation between the <i>Länder</i> with respect to the frequency of controls (as a percentage of all farms). These differences can partly be attributed to variance in the number of controls (in the east German federal states with their large farms a much higher percentage of all farms is subject to controls than in those regions were small farms prevail¹⁰) but can also be due to diverse definitions of what is to be considered as a control. To achieve more comparable results working groups of representatives of the <i>Länder</i> have been established.</p> <p>3. see above</p> <p>4. The indicators for the control of the Fertilisation Ordinance follow the paragraphs of</p>
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¹⁰ Farms smaller than 10 ha are exempt of many rules of the Fertilisation Ordinance which reduces the need for control on these farms.

the Ordinance and can in general be considered as suitable for the control of GFP of fertilisation, as they cover important environmental aspects. The indicators used can be divided into two categories: indicators suitable for random samples (c, d, e) and indicators relevant mostly for controls due to suspicion or complaint (a, b).

With respect to plant protection the control of GFP is much more fragmentary. One main reason is that some aspects of plant protection law are nearly impossible to control although they are considered to be major sources of pollution (Bach et. al. 1999). Neither the distances which have to be kept to non target areas can be controlled, as they vary for different products, different regions and according to the environmental quality of the non-target area in question. Nor the cleaning of the sprayer which has to be carried out on the field and not on the farm. Control would be feasible if these aspects would be linked (or limited) to technical provisions such as drift minimising nozzles or extra cleaning water tanks installed on the sprayer.

The indicators for the control of GFP leave out important environmental aspects like biological diversity and soil protection. Also the possibility to detect breaches is low as less than 1 % of all farms are controlled.

5. Statistics on breaching:

Indicator	Breaches*	%
Control of prevention of direct entry of fertiliser into watercourses	37	3
Control of the compliance with the periods when the application of manure is prohibited	58	6
Control of the maximum amount of livestock manure applied to arable land and grassland	46	1
Control of the soil tests or the local recommendations	692	7
Control of the documentation of examinations and estimates used, fertiliser plans, nutrient balances	424	6
Control of the compliance with the restrictions and		

		<p>interdictions for the application of certain pesticide ingredients and for specific sites</p> <p>Control of plant protection expert knowledge certificate</p> <p>Control of the inspection certificate of field sprayers</p> <p>*:independent from the character of the procedure initiated (rulings, admonishments, admonishment fines or administrative offence fines)</p> <p>No statistics on the number of sanctions (fines) exists.</p>	<p>129</p> <p>95</p> <p>256</p> <p>3</p> <p>2</p> <p>4</p>
	<p><i>Reg. (EC) 1257/1999</i></p> <ol style="list-style-type: none"> 1. Frequency of control / risk analysis 2. Number of farms controlled, % of all farms 3. Random sample inspections or inspections for specific reasons (e.g. due to suspicion or due to complaint) 4. Indicators for control (which indicators, appropriate for control, possibility to detect breaching) 5. Statistics on breaching and sanc- 	<ol style="list-style-type: none"> 1. At least 5 % of the beneficiaries of a measure are controlled on a yearly basis (in cases of detected breaches this number can be increased). 2. In the German average 15 % (0 % to 32 %) of the utilised agricultural area (UAA) and 32 % of all farms received less favoured area (LFA) support in 2001¹¹. Under the assumption that 5 % of all LFA beneficiaries have been subject to IACS inspections, an average of 1,6 % of all German farms were controlled. In the same year, agricultural environmental measures (AEM) were implemented on about 8 % (1 % to 35 %) of the UAA.¹² 3. Random sample inspections 4. Control of: <ul style="list-style-type: none"> • immediate incorporation of livestock manure and liquid sewage sludge on uncultivated arable land, • the documentation of examinations and estimates used, fertiliser plans, nutrient 	

¹¹ The city states of Berlin, Hamburg and Bremen are not included.

¹² As farms receiving less favoured area support can additionally implement AEI, summing up these surfaces would be misleading when calculating the average proportion of UAA subject to IACS controls.

	tions	<p>balances (N, P, K),</p> <ul style="list-style-type: none"> • the soil tests or the local recommendations, • the inspection certificate of field sprayers, • the plant protection expert knowledge certificate (<i>Sachkundenachweis</i>). <p>Just like the indicators for the control of GFP according to Reg. (EC) 1259/1999 and national law, important environmental aspects are omitted. The selected indicators are less adequate for the control of compliance with the codes of GFP as important aspects of fertilisation (i.e. the observance of the maximum amount of livestock manure to be applied) and plant protection are missing¹³.</p> <p>With a control frequency of at least 5 % of all beneficiaries, the potential risk of being caught when breaching codes of GFP is much higher than with respect to the control of GFP according to Reg. (EC) 1259/1999 and national law.</p> <p>5. No official statistic on breaching and sanctions is available in Germany. The European Commission only requires a report on all breaches registered by the IACS and sanctions imposed. The number of farms not respecting GFP is thus mixed with information on farmers declaring larger acreage etc.</p>
<p>Sanctions</p>	<p><i>Reg. (EC) 1259/1999 and national law</i></p> <ol style="list-style-type: none"> 1. Fines and reductions of premia for breaching mandatory requirements (amounts of money, share of premiums) 2. Other sanctions or consequences 3. higher probability of inspections 	<ol style="list-style-type: none"> 1. Fines are imposed according to the severity of the environmental damage ascertained or expected due to the breach. Most federal states do not dispose of a catalogue of administrative fines but leave it to the administration to fix the amount. In consequence, there is a high degree of variation from case to case and between the federal states (i.e. in cases where the inspection certificate of field sprayers was missing, fines between 25 to 1150 • have been imposed in the years 2000 to 2002). <p>No reduction of payments is realised as cross-compliance is not implemented in Germany.</p>

¹³ The choice of the indicators is determined by the qualifications of the inspectors. As the IACS inspections are not carried out by plant protection of fertilisation experts, the control indicators can only cover aspects easily verifiable for a layperson.

	after breaching	<p>2. -</p> <p>3. In federal states were inspections are not only carried out on suspicion or complaint but also following a risk analysis, farms that have been caught breaching the codes of GFP are preferentially inspected in the following year.</p>
<p><i>Reg. (EC) 1257/1999</i></p> <p>1. Fines and reductions of payments for breaching mandatory requirements (amounts of money, share of premiums)</p> <p>2. Other sanctions or consequences</p> <p>3. higher probability of inspections after breaching</p>	<p>1. The federal states apply different systems of sanctions ¹⁴ :</p> <p>Baden-Württemberg abatement at the amount of the administrative offence fine</p> <p>Bavaria percentage abatement according to the severity of the breaching (5 %, 10 %, 20 %)</p> <p>Berlin percentage abatement according to the severity of the breaching (5 %, 10 %, 20 %) (stage of affairs in 2002, Information from BMVEL 6/03)</p> <p>Brandenburg percentage abatement according to the severity of the breaching (5 %, 10 %, 20 %)</p> <p>Hamburg reclaim of the entire payment if an administrative fine is imposed (stage of affairs in 2002, Information from BMVEL 6/03)</p> <p>Hesse abatement amounting to the administrative offence fine but not less than 10% and not exceeding 50 % of the payment (Barunke 2002, p. 94)</p> <p>Mecklenburg-Western Pomerania percentage abatement of 10 % if an administrative fine is imposed</p> <p>Lower Saxony since 2003: percentage abatement according to the severity of the breaching (5 %, 10 %, 20 %)</p>	

¹⁴ If no further source is given, the information stems directly from the ministries of the federal states.

		<p>before 2003: abatement amounting to twice the administrative offence fine</p> <p>North Rhine-Westphalia abatement amounting to the administrative offence fine</p> <p>Rhineland-Palatinate abatement only in case of repeated breach, then total exclusion from the measure (Barunke 2002, p. 94)</p> <p>Saarland abatement amounting to the administrative offence fine plus the fine of admonishment (stage of affairs in 2002, Information from BMVEL 6/03)</p> <p>Saxony percentage abatement according to the severity of the breaching (5 %, 10 %, 20 %)</p> <p>Saxony-Anhalt percentage abatement of 10 % if an administrative fine is imposed (even if the fine has not yet become final)</p> <p>Schleswig-Holstein abatement amounting to the administrative offence fine (stage of affairs in 2002, Information from BMVEL 6/03)</p> <p>Thuringia reclaim of 5000 • but not exceeding 50 % of the payment</p> <p>1. No other sanctions or consequences (except for the fine which has to be paid)</p> <p>2. As the risk analysis carried out in some states for the IACS control is not based on environmental risk assessment but on criteria such as the financial volume the probability of inspections after breaching is not higher.</p>
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