

# Country Report

for Germany

Implementation and status of priority measures

Baltic Compass WP3

## Cover Note

In order to keep the focus of the data collection narrow, we are not interested in collecting information on EU regulatory requirements that are common to the BSR. Instead please focus on those requirements that are specifically national or local in design. For example, do not cover Nitrates Directive requirements that are common BSR (eg N-limit) but DO cover the way that action plans have been devised, what they include and how they operate.

To avoid repetition, if the information you are supplying in a section is common to several measure then please provide a description on one form only and then make links back to this form.

## 1. Promoting long-term grass cultivation of arable land

**Cultivation of grass or legume/grass crops** on arable land with high/low inputs of nitrogen (N) and phosphorus (P) and high/low outputs of feed, food or other services can reduce nitrogen and phosphorus leaching and surface run-off losses as well as soil erosion, compared with annual crops on arable land.

Crop rotations including **permanent grass or legume/grass crops** can decrease N leaching with 50%, compared with crop rotations dominated by annual crops.

*Describe this measure in your country if different* : This measure has been existing until 2010. Today it is no longer a supported measure.

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

Reference(s) to legislation:

Comments:

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

Reference(s) to subsidy rules:

Comments:

## 2. Vegetative cover in autumn and winter of arable land

**Annual winter crops**, such as winter wheat or winter rape, can provide a vegetative cover that actively takes up available nitrogen and phosphorus from the soil more efficient than annual spring crops at a seasonal period with high precipitation and cool climate.

**Catch crops** can be under-sown in the main crop, simultaneously with, or just after the sowing of this crop. When the main crop is harvested, the catch crop has an established root system ready to take up nitrogen from the soil during late summer and autumn. Nitrogen that otherwise could have been leached is then taken up and incorporated into plant material. The catch crop is then ploughed-in as late as possible in autumn or in spring. Perennial ryegrass (*Lolium perenne* L.) as a catch crop is an effective measure to reduce N leaching in spring cereal crop production. The use of catch crops has reduced N leaching by 50% or more in several studies. The effect of the catch crop on N leaching depends on precipitation and drainage conditions, available N amounts in soil and how successful the establishment of the catch crop was.

*Describe this measure in your country if different* : As described above, but further:

Obligation for min. 5 years. Measure is available for areas within "endangered groundwater areas" (according to WFD).

1. *Is there any official quantified goal that states to what extent this measure should be implemented?*

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years?  
quantity and unit:

2. *To what extent is this measure implemented today in relation to goal set above?*  1  
"0"=Not at all; "10"=Goal already reached

3. *If goal is not reached; how do you judge the possibilities to fulfill it?*  1  
"0"=Impossible; "10"=Very good

*Comments:* The desirable level is always the highest possible amount of implementation area. Here e.g. area of maize cultivation.

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?*  Yes If "Yes"; national  or regional  rules

**Reference(s)** to legislation:MSL-Richtlinie (Directive on Land management suited to the market and habitat)

*Comments:*

*Is this measure entitled to economic subsidy?*  Yes If "Yes"; national  or regional

subsidy rules

**Reference(s) to subsidy rules:** Zukunftsprogramm ländlicher Raum (ZPLR) 2007-2013 (RD-Programme for the future for rural areas)

Comments:

### 3. Soil tillage management

**3.1. Reducing soil tillage** by conversion from ploughing to minimal or no cultivation management systems or conversion from deep ploughing to shallow ploughing can reduce mineralization of organic matter in soil. Type of techniques can be, i.e. using discs or tines to cultivate the soil, or direct drill into stubbles (no-till).

Describe this measure in your country if different :

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  No  If "Yes"; national  or regional  rules

**Reference(s) to legislation:**

Comments: This measure concerns principles of good agricultural practice which are embedded within different laws (e.g. Federal Soil Protection Act). But there is no obligation to use especially this measure.

Is this measure entitled to economic subsidy?  No  If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

Comments:

**3.2 Time-of the year effects.** By postpone tillage actions from autumn to spring, the mineralized nitrogen will be available for uptake by the established spring crops, which also will provide surface cover.

*Describe this measure in your country if different :*

1. *Is there any official quantified goal that states to what extent this measure should be implemented?*

- *If "Yes";*
  - a) *specify quantity and unit:*
  - b) *if applicable, what year to be realized?*
  - c) *give reference(s):*
- *If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.*

2. *To what extent is this measure implemented today in relation to goal set above?*   
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3. *If goal is not reached; how do you judge the possibilities to fulfill it?*   
*"0"=Impossible; "10"=Very good*

*Comments:*

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?*  *If "Yes"; national  or regional  rules*

**Reference(s) to legislation:**

*Comments:*

*Is this measure entitled to economic subsidy?*  *If "Yes"; national  or regional  subsidy rules*

**Reference(s) to subsidy rules:**

*Comments:*

**4. Fertilisation management**

**4.1. Adapting amounts applied for both chemical fertilizer and manure.**

Animal density is a tool to express the number and type of animals kept at the farm in relation to the arable area available for spreading their manure. The tool is used to balance amounts of produced N and P in manure to available spreading area at the farm in order to avoid surplus application of N and P with manure.

Considering crop requirements of N and P in the fertilising plan is a prerequisite for avoiding excessive applications. Nitrogen and P content in manure shall be

considered in the fertiliser plan in order to adapt the need of chemical fertilizers and avoid excessive applications.

Sampling and analysing N and P in manure gives information of the N and P concentration and the distribution of plant available-N and organic-N. Then the effect of the manure can be valued in the fertilising plan. Manure characteristics can vary a lot. Liquid manure is a general term that denotes any manure from housed livestock that flows under gravity and can be pumped. Liquid manure can have a high proportion of plant available N (NH<sub>4</sub>-N + NH<sub>3</sub>-N) of total-N content. Solid manure is a general term that denotes any manure from housed livestock with large amounts of bedding that does not flow under gravity, cannot be pumped but can be stacked in a heap. Solid manure can have a high proportion of organic-N of total-N content.

Sampling and analysing N and P in arable soil gives information of soil fertility concerning these nutrients, which should be considered in the fertilising plan in order to avoid excessive fertilizer applications or deteriorated soil fertility.

*Describe this measure in your country if different* : As described above, but further:

Application of fertiliser with mainly organic components (including manure) is allowed, only if the amount of N-total, P and for liquid manure also ammonium nitrogen is known/has been determined (as measured value or estimated value).

Before application of nutrients, the amount of nutrients in the soils has to be determined. A determination of N has to be made at least yearly, for P at least every 6 years.

1. *Is there any official quantified goal that states to what extent this measure should be implemented?* **Yes**

- *If "Yes";*
  - a) *specify quantity and unit:* 100 %
  - b) *if applicable, what year to be realized?* current law
  - c) *give reference(s):* CrossCompliance-relevant
- *If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:*

2. *To what extent is this measure implemented today in relation to goal set above?* **10**  
*"0"=Not at all; "10"=Goal already reached*

3. *If goal is not reached; how do you judge the possibilities to fulfill it?* **10**  
*"0"=Impossible; "10"=Very good*

*Comments:* Because this measure is regulated by law, every farmer has to follow it. So it is implemented within the whole agricultural area.

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?* **Yes** *If "Yes"; national*  *or regional*  *rules*

**Reference(s) to legislation:** Düngeverordnung (Fertiliser Regulation)

*Comments:*

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

*Comments:* Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

#### 4.2. Calculating nutrient balances on farm- and/or field level

Calculating N and P inputs/outputs and balances on farm and/or field level is a performance tool and a policy tool for assessing the environmental impact. The tool can also be used to monitor and evaluate the impacts of alternative manure and chemical fertilizer management practices and technologies on N and P use at the farm. When farm N and P balances can be linked to within-farm N and P sources and flows, there is a good possibility to identify the weakest link and possible improvements on the farm. The tool can be used to assess the risk of ammonia losses from manure management and the risk of N leaching losses to water.

*Describe this measure in your country if different :* As described above, but further:

Before application of nutrients, the supply of nutrients has to be determined. The determination of nutrient supply has to consider: Nutrient supply of plants, amount of nutrients available in the soil, amount of lime and humus of the soil, cultivation conditions.

The latest on 31.3., a nutrient balance for N and P has to be made on farm level or on field level (than an aggregation to farm level is possible).

1. Is there any official quantified goal that states to what extent this measure should be implemented? **Yes**

- If "Yes";
  - a) specify quantity and unit: 100 %
  - b) if applicable, what year to be realized? current law
  - c) give reference(s): CrossCompliance-relevant
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.

2. To what extent is this measure implemented today in relation to goal set above? **10**  
"0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **10**  
"0"=Impossible; "10"=Very good

*Comments:* Because this measure is regulated by law, every farmer has to follow it. So it is implemented within the whole agricultural area.

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation? **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** Düngeverordnung (Fertiliser Regulation)

Comments:

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

Comments: Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

### 4.3. Avoiding the spreading of chemical fertilizers and manure during high-risk periods.

The timing of chemical fertilizer and manure application is a key factor to have a high plant nutrient use efficiency. Poor timing is one of the most important sources of large N leaching loads.

Describe this measure in your country if different : As described above, but further:

Blocking period for spreading of fertiliser on arable land (1. November until 31. January) and on grassland (15. November until 31. January).

1. Is there any official quantified goal that states to what extent this measure should be implemented? **Yes**

- If "Yes";
  - a) specify quantity and unit: 100 %
  - b) if applicable, what year to be realized? current law
  - c) give reference(s): CrossCompliance-relevant
- If "No", what is your expert opinion of the desirable level in 5 years?  
quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above? **10**  
"0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **10**  
"0"=Impossible; "10"=Very good

Comments: Because this measure is regulated by law, every farmer has to follow it. So it is implemented within the whole agricultural area.

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation? **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** Düngeverordnung (Fertiliser Regulation)

Comments:

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

*Comments:* Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

**4.4. No or reduced P-fertiliser for high soil P fields or part of fields.**

When the soil P values increase beyond agronomical optimum ranges, there is a reasonable consistence pattern whereby P leaching increase significantly. However, P leaching has large spatial and temporal variations and can be influenced by several factors interacting with each other. It is therefore important to consider site-specific factors to be able to find measures to reduce P leaching.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented? **Yes**

- If "Yes";
  - a) specify quantity and unit: 100 %
  - b) if applicable, what year to be realized? current law
  - c) give reference(s): CrossCompliance-relevant
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above? **10**  
"0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **10**  
"0"=Impossible; "10"=Very good

*Comments:*

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation? **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** Düngeverordnung (Fertiliser Regulation)

*Comments:*

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

*Comments:* Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

## 5. Improved spreading technology of manure and chemical fertiliser

**5.1 Site-specific dosage.** In all fertiliser application, the use of **Global Positioning System (GPS)** signals for the purpose of determining the device's current location on earth can improve the possibilities for a controlled and proper distribution. GPS devices provide latitude and longitude information, and some may also calculate altitude. GPS in combination with **steering aid systems** means that the fertiliser can be spread with a minimum of bare spots and overlaps. The simpler variant of the steering aid system is called **guidance**, where a ramp with a series of LEDs shows whether the driver is located right on line or if he should adjust to the right or left. **Auto steer** is an automated steering system where the driver does not need to actively steer the vehicle except perhaps in curves or when turning. With the use of GPS technology, it is also possible to map different properties in the field, and later on use this information e.g. for **site specific spreading** of fertilisers.

Describe this measure in your country if different :

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  No  If "Yes"; national  or regional  rules

Reference(s) to legislation:

Comments: .

Is this measure entitled to economic subsidy?  No  If "Yes"; national  or regional  subsidy rules

Reference(s) to subsidy rules:

Comments: This measure concerns principles of good agricultural practice which are embedded within different laws (e.g. Federal Soil Protection Act). But there is no obligation to use especially this measure.

**5.2 Combined drilling** is when seeding and fertilisation is done with one and the same machine in one working operation. A drilling machine with normal distance between the drill coulters is equipped with coulters for chemical fertilisers placed in front of the drill coulters between every other row. Fertiliser coulters are placing chemical fertiliser a few centimetres deeper than the seeds.

Chemical fertiliser placed at this depth, provides good conditions for the crop to take up the added nutrients. This procedure is, in addition to time savings and a better nutrient utilization, reducing competition for plant nutrients from weeds and reduces the risk of nutrient surface runoff. Phosphorus in fertilizers binds quickly to soil particles and is thus less exposed to leaching.

The recommended nitrogen ration at a given harvest level can be reduced by 10 kg N / ha, if combined drilling is applied (Albertsson, 2010). Leaching will probably be reduced by 1-2 kg N/ha compared with other fertilization techniques.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

*Comments:*

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?  No If "Yes"; national  or regional  rules*

*Reference(s) to legislation:*

*Comments:*

*Is this measure entitled to economic subsidy?  No If "Yes"; national  or regional  subsidy rules*

*Reference(s) to subsidy rules:*

*Comments:* This measure concerns principles of good agricultural practice which are embedded within different laws (e.g. Federal Soil Protection Act). But there is no obligation to use especially this measure.

**5.3 Incorporation** of manure and chemical fertiliser may be achieved with equipments such as discs or cultivators depending on soil type and soil conditions. Usually the incorporation is done in a separate working operation. The manure/ chemical fertiliser must be completely incorporated within the soil to achieve maximum efficiency. As regards liquid manure, incorporation should be made quickly after spreading as ammonia losses takes place immediately after spreading.

This method will help to prevent the exposure of manure to the surface runoff and drain-flow losses. It will also increase the utilisation of manure nutrients compared with surface application.

*Describe this measure in your country if different :*

There is no obligation to incorporate manure and fertiliser immediately, except for some restrictions (see 6).

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation?  No    If "Yes"; national  or regional  rules

**Reference(s) to legislation:**

Comments:

Is this measure entitled to economic subsidy?  No    If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

Comments:

**5.4 Liquid manure.** Distribution uniformity of liquid manure has improved significantly with the introduction of **band spreading** technology, where the manure is discharged just above ground level in strips or bands through a series of hanging

or trailing pipes attached to a boom. As the liquid manure is distributed laterally via a ramp, good lateral distribution uniformity is achieved. The spread in the longitudinal direction can also be kept at a constant level by means of the pumping equipment which is part of the equipage. Some newer spreaders are also equipped with a **control system** that automatically adjusts the output to the driving speed, which will keep the application rate to the desired level.

**Injection** of liquid manure means that it is applied directly into the active layer of soil, either in open or in closed slots. In the latter case manure is fully covered after injection, by closing the slots with press wheels or rollers fitted behind the injection tines. Closed-slot injection is more efficient than open-slot for decreasing the ammonia emission. To obtain this added benefit, soil type and conditions must allow effective closure of the slot.

*Describe this measure in your country if different :* As described above, but further:

The whole amount of used liquid manure has to be distributed with one of the mentioned methods. Period for application: grassland (1.2. until 31.7) and arable land (1.2. until 31.8.), exception: winter rape (until 15.9.).

1. *Is there any official quantified goal that states to what extent this measure should be implemented?* **No**

- *If "Yes";*
  - a) *specify quantity and unit:*
  - b) *if applicable, what year to be realized?*
  - c) *give reference(s):*
- *If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.*

2. *To what extent is this measure implemented today in relation to goal set above?* **3**  
 "0"=Not at all; "10"=Goal already reached

3. *If goal is not reached; how do you judge the possibilities to fulfill it?* **10**  
 "0"=Impossible; "10"=Very good

*Comments:* The mentioned techniques of manure distribution will be legal standard in the future. So every farmer will have to participate. Today it is still a subsidized measure.

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?* **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** MSL-Richtlinie (Directive on Land management suited to the market and habitat)

*Comments:*

*Is this measure entitled to economic subsidy?* **Yes** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:** Zukunftsprogramm ländlicher Raum (ZPLR) 2007-2013

(RD-Programme for the future for rural areas)

*Comments:* Obligation for min. 5 years, no reduction of the area of permanent grassland, manure application during a defined period (grassland 1 February until 31 July, arable land 1 February until 31 August, exception: winter rape until 15 September), yearly laboratory test of manure (N<sub>tot</sub>, NH<sub>4</sub>-N), yearly fertilisation planning for each field.

**5.5 Solid manure.** In solid manure handling, **disintegration equipment** has been developed that breaks the manure better and gives greater working width and more uniform spreading laterally. Distribution of solid manure in the longitudinal direction and opportunities to set the intended application rate still leaves much to be desired.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

*Comments:*

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

**Reference(s) to legislation:**

*Comments:*

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

*Comments:*

**5.6 Manure spreading and NH<sub>3</sub> emissions – general measures.** Variables significantly affecting NH<sub>3</sub> emissions after spreading of manure are soil water content, air temperature, wind speed, manure type, dry matter content of manure, total ammoniacal nitrogen content of manure (TAN=NH<sub>3</sub>-N+NH<sub>4</sub>-N), application method and rate and manure incorporation. Losses of NH<sub>3</sub> can vary between 3 to 90% of the NH<sub>4</sub>-N applied with manure.

Describe this measure in your country if different :

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
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Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

Reference(s) to legislation:

Comments:

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

Reference(s) to subsidy rules:

Comments:

## 6. Avoiding the application of chemical fertilisers and manure to high-risk areas

Examples of high risk areas on arable land are those: with a significant slope, with flushes draining to a nearby watercourse, soils with cracks over field drains, fields adjacent to water or fields with phosphorus values beyond agronomical optimum ranges.

*Describe this measure in your country if different :*

Application is prohibited, if the soil is flooded, water saturated, frozen or snow covered (more than 5cm). A distance to surface waters has to be kept. On areas which are highly inclined (>=10% within the first 20m) it is prohibited to applicate fertiliser in the first 3m near the water. Within the distance from 3 to 10m an application is allowed, if a direct injection is practised. On the rest of the inclined area an immediate incorporation of fertiliser is necessary, except if the vegetation cover of the area is sufficient.

1. Is there any official quantified goal that states to what extent this measure should be implemented? **Yes**

- If "Yes";
  - a) specify quantity and unit: 100 %, not only to high-risk areas
  - b) if applicable, what year to be realized? current law
  - c) give reference(s): CrossCompliance-relevant
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above? **10**  
"0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **10**  
"0"=Impossible; "10"=Very good

*Comments:* Because this measure is regulated by law, every farmer has to follow it. So it is implemented within the whole agricultural area

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation? **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** Düngeverordnung (Fertiliser Regulation)

*Comments:*

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

*Comments:* Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

## 7. Measures to optimize soil pH and improve soil structure

Measures to improve soil fertility and soil structure can increase the crop's plant nutrient use efficiency and decrease the risk of N and P leaching and surface run-off. Such measures can be liming for improved soil structure or liming for optimizing soil pH.

*Describe this measure in your country if different : As described above, but further:*

Lime with more than 0,5% P<sub>2</sub>O<sub>5</sub> is handled according to Fertiliser Regulation (see 6.).  
Exemption: Prohibition of application on frozen soils is only valid for lime with more than 2% P<sub>2</sub>O<sub>5</sub>.

1. Is there any official quantified goal that states to what extent this measure should be implemented? **Yes**

- If "Yes";
  - a) specify quantity and unit: 100 %
  - b) if applicable, what year to be realized? current law
  - c) give reference(s): CrossCompliance-relevant
- If "No", what is your expert opinion of the desirable level in 5 years?  
quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above? **10**  
"0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **10**  
"0"=Impossible; "10"=Very good

*Comments:* Because this measure is regulated by law, every farmer has to follow it. So it is implemented within the whole agricultural area

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation? **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** Düngeverordnung (Fertiliser Regulation)

*Comments:*

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

*Comments:* Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

## 8. Adapted feeding

### 8.1 Adopting phase feeding of livestock

Livestock at different growth stages or stages of the reproductive cycle have different optimum nutritional requirements. Greater division and grouping of livestock on the basis of their feed requirements allows more precise formulation of individual rations. This increases the animal's nutrient use efficiency and results in reduced excreted amounts of nitrogen and phosphorus in fresh animal faeces and urine.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

**Reference(s) to legislation:**

Comments:

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:**

Comments:

### 8.2 Reducing dietary nitrogen and phosphorus intakes

Farm animals are often fed diets with higher than recommended contents of nitrogen and phosphorus as a safeguard against a loss of production arising from a deficit of these nutrients. A surplus intake of nitrogen and phosphorus is not utilised by the animal and is excreted with faeces and urine, leading to a larger N and P content in the manure. Therefore a ratio balancing of nutrients in feed is a key factor to both ensure animal health and production requirements and minimizing adverse

environmental impacts. To improve nutrient use efficiency purchased as well as home-produced feed components need careful management and analysis of nutrient content and dietary value.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented? 
  - If "Yes";
    - a) specify quantity and unit:
    - b) if applicable, what year to be realized?
    - c) give reference(s):
  - If "No", what is your expert opinion of the desirable level in 5 years?  
quantity and unit:
2. To what extent is this measure implemented today in relation to goal set above?   
"0"=Not at all; "10"=Goal already reached
3. If goal is not reached; how do you judge the possibilities to fulfill it?   
"0"=Impossible; "10"=Very good

Comments:

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?  If "Yes"; national  or regional  rules*

**Reference(s) to legislation:**

Comments:

*Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules*

**Reference(s) to subsidy rules:**

Comments:

### 8.3 Phytase supplementation

Supplementation of synthetic phytase to pig feed reduces the need for the addition of mineral phosphate. Phytase increases the availability of phosphorus in the feed and allows total phosphorus contents to be reduced without affecting productivity. With the addition of phytase the phosphorus content of the feed can be reduced by up to 30% for pig feed.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

Reference(s) to legislation:

Comments:

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

Reference(s) to subsidy rules:

Comments:

**8.4 Wet feed and fermentation**

Endogenous phytase in grain can be activated by wetting the pig feed some time before feeding thereby reducing or even eliminating the need for mineral phosphorus supplementation. This means that pig production with wet feed systems should be able to utilise feed with lower phosphorus content than normally recommended.

Fermentation of the feed can reduce the need for mineral phosphate supplementation. Fermentation occurs naturally in wet feed after a certain amount of time. The fermentation process is difficult to manage and the method is still to be developed.

Describe this measure in your country if different :

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

Reference(s) to legislation:

Comments:

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

Reference(s) to subsidy rules:

Comments:

**9. Reducing ammonia losses in stable**

Key emissions to air from animal housing emissions are ammonia (NH<sub>3</sub>), odor and dust. The level and variation of ammonia emissions from animal housing are determined by many factors, which also interact. Factors influencing ammonia emissions from animal housing are:

- Increased nitrogen use efficiency.
- Decreased emitting areas with manure in the stable.
- Avoiding high temperature in stable and manure
- Adapting airflows along manure surfaces.
- Use and choice of bedding material.

Describe this measure in your country if different :

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit.

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

Comments:

Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules

Reference(s) to legislation:

Comments:

Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules

Reference(s) to subsidy rules:

Comments:

**10. Storage of manures**

Adequate collection and storage facilities provide the possibility to choose a time to apply manure to fields when the crops can utilize N and P and there will be fewer occasions when lack of capacity forces the farmer to spread manure at unsuitable times.

Manure storage must be of such a quality that it prevents N, P and manure losses. The main influencing factors on the ammonia losses from storages are manure properties (pH, dry matter content) temperature and wind conditions, filling technology, storage time, and for liquid manure storage ratio surface: volume, crust formation and mixing methodology.

Ammonia losses can be sharply reduced if the air directly above the liquid manure store is prevented from circulating. A method that efficiently reduces NH<sub>3</sub> losses is to cover the liquid manure stores with, for instance, a roof, a floating plastic cover or a stable natural crust. If the liquid manure storage is filled underneath the cover, this can be kept intact even during filling, which reduces the risk of NH<sub>3</sub> losses.

From storages with solid manure, especially if composting take place with high temperatures, NH<sub>3</sub> losses could be high. Peat included in the bedding material will reduce NH<sub>3</sub> losses during storage. Roofs on solid manure storages could be an effective measure to reduce ammonia losses from solid manure storages. Additionally, a roof keeps rainwater away,

which could prevent nutrient leakage from the manure pad if it has insufficient or lacking drainage leading to a collection pit.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented? **Yes**

- If "Yes";
  - a) specify quantity and unit: 100 %
  - b) if applicable, what year to be realized? current law
  - c) give reference(s): CrossCompliance-relevant
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above? **10**  
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **10**  
 "0"=Impossible; "10"=Very good

*Comments:* Because this measure is regulated by law, every farmer has to follow it. So it is implemented within the whole agricultural area.

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation?  If "Yes"; national  or regional  rules  
**Reference(s)** to legislation: Düngeverordnung (Fertiliser Regulation), Landesverordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (State Regulation on Plants handling with Substances Hazardous to Waters, VAWS)

*Comments:*

Is this measure entitled to economic subsidy? **No** If "Yes"; national  or regional  subsidy rules

**Reference(s)** to subsidy rules:

*Comments:* Because this measure is regulated by law (DüV, Fertiliser Regulation), every farmer has to follow it. So it is implemented within the whole agricultural area. This measure is CrossCompliance-relevant.

## 11. Constructed wetlands for nutrient reduction/retention

### 11.1 Sedimentation ponds

Small surface flow wetlands designed primarily to retain phosphorous. This is achieved by retaining eroded phosphorous bound to aggregates and particulate materials in the run-off water by optimizing the conditions for sedimentation processes. To some extent phosphorous and other nutrients are reduced due to biological and chemical decomposition and transformation processes as well as plant uptake.

A sedimentation pond is suitable for establishment in highly intensive small-scale agricultural areas. The ponds are relatively small representing approximately 0.1 – 0.5 % of the run-off area. The sedimentation pond is constructed for instance by widening a section in a ditch into a sedimentation pond slowing down the speed of the run-off water hence increasing sedimentation.

A sedimentation pond is often designed as a serial combination of (i) a sedimentation basin with a water depth of 1-1.5 m representing 20-30% of the total area of the sedimentation pond where the main sedimentation of larger particles takes place, followed by (ii) a wetland filter covered with typical wetland plants providing good conditions for sedimentation of smaller particles. In case the area is highly sloped it is suitable to include an overflow area followed by a second wetland filter prior to the outlet to further induce the sedimentation efficiency.

The accumulated sediments in the sedimentation basin need to be removed on regular basis for maintenance.

*Describe this measure in your country if different :*

1. Is there any official quantified goal that states to what extent this measure should be implemented?

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above?   
 "0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it?   
 "0"=Impossible; "10"=Very good

*Comments:*

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?  If "Yes"; national  or regional  rules*

**Reference(s) to legislation:**

*Comments:*

*Is this measure entitled to economic subsidy?  If "Yes"; national  or regional  subsidy rules*

**Reference(s) to subsidy rules:**

*Comments:*

**11.2 Constructed wetlands**

Large free water surface wetlands are designed and constructed primarily for removal of nutrients, e.g. nitrogen and phosphorous and other pollutants from run-off water through sedimentation, biological and chemical transformation and degradation and plant uptake. Constructed wetlands have additional benefits, i.e. improved biodiversity, water storage capacity, resource recovery, irrigation possibilities and production of crop biomass.

Constructed wetlands are established, or re-established, to receive water from large run-off areas in arable as well as agricultural areas. The run-off area should be represented by at least 50 percent intensive agricultural land use with the constructed wetland covering approximately 0.5–4 % of the total run-off area.

An important characteristic is the establishment of typical emerges and submerges wetland vegetation. A constructed wetland provides heterogenic water regimes and environments. It is common with a mixture of areas with (i) permanently high water level, more or less covered with typical wetland vegetation, as well as (ii) periodically waterlogged areas with low water level. The water regime can also vary over the year.

*Describe this measure in your country if different :*

1. *Is there any official quantified goal that states to what extent this measure should be implemented?*

- *If "Yes";*
  - a) *specify quantity and unit:*
  - b) *if applicable, what year to be realized?*
  - c) *give reference(s):*
- *If "No", what is your expert opinion of the desirable level in 5 years? quantity and unit:*

2. *To what extent is this measure implemented today in relation to goal set above?*   
*"0"=Not at all; "10"=Goal already reached*

3. *If goal is not reached; how do you judge the possibilities to fulfill it?*   
*"0"=Impossible; "10"=Very good*

*Comments:*

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

*Is this measure regulated in legislation?*  *If "Yes"; national  or regional  rules*

**Reference(s) to legislation:**

*Comments:*

*Is this measure entitled to economic subsidy?*  *If "Yes"; national  or regional  subsidy rules*

**Reference(s) to subsidy rules:**

Comments:

## 12. Buffer-zones along water areas and erosion sensitive field areas

Buffer zones are uncultivated areas between fields and water courses, main ditches, ponds, lakes or gulfs. Buffer zones are also to be implemented in erosion sensitive field areas such as around surface water wells or surrounding field areas with high ground water levels.

Buffer zones reduce the speed of water surface run-off mitigating losses of eroded aggregates, soil particles, and particulate phosphorous and other soil borne pollutants. They also decrease the risk of freshly spread manure and pesticides to reach the water environment. Buffer zones are an especially important measure in areas with eroding problems. Buffer zones also provide conditions for biological and chemical transformation of pollutions as well as plant uptake.

The buffer zones are under permanent plant cover of dense grass or vegetation. Buffer zones are situated on former agricultural land and have a width of 5-20 m. They are not allowed to be cultivated, fertilized or sprayed with herbicides or pesticides. The vegetation should be kept dense and plants should be established if needed for maintenance.

*Describe this measure in your country if different :* As described above, but further:

The width of the buffer accounts 6-24m.

1. Is there any official quantified goal that states to what extent this measure should be implemented? **No**

- If "Yes";
  - a) specify quantity and unit:
  - b) if applicable, what year to be realized?
  - c) give reference(s):
- If "No", what is your expert opinion of the desirable level in 5 years?  
quantity and unit:

2. To what extent is this measure implemented today in relation to goal set above? **3**  
"0"=Not at all; "10"=Goal already reached

3. If goal is not reached; how do you judge the possibilities to fulfill it? **5**  
"0"=Impossible; "10"=Very good

Comments: The desirable level is always the highest possible amount of implementation area. Here e.g. area along ditches.

*Comments on why the goal is easy/difficult to reach, what are the most important parameters in your country:*

Is this measure regulated in legislation? **Yes** If "Yes"; national  or regional  rules

**Reference(s) to legislation:** MSL-Richtlinie (Directive on Land management suited to the market and habitat)

Comments:

Is this measure entitled to economic subsidy? **Yes** If "Yes"; national  or regional  subsidy rules

**Reference(s) to subsidy rules:** Zukunftsprogramm ländlicher Raum (ZPLR) 2007-2013 (RD-Programme for the future for rural areas)

Comments: : Obligation for min. 5 years, no reduction of the area of permanent grassland, protection strips on maximum 15% of the arable land (width of min. 6, max. 24 meters), Sowing of a mixture of site-adapted plant species, no tillage, except for trimming, no spreading of fertiliser and pesticides, no grazing, no storage of machines, farming equipment and other tools.

DRAFT

**List of used words**

**Agricultural land** (also **agricultural area**) denotes the land suitable for agricultural production, both crops and livestock.

**Arable land** is land under temporary agricultural crops, temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years). The abandoned land resulting from shifting cultivation is not included in this category.

**Permanent crops** - land cultivated with long-term crops which do not have to be replanted for several years; land under trees and shrubs producing flowers, such as roses and jasmine; and nurseries (except those for forest trees, which should be classified under "forest")

**Permanent meadows and pastures** - land used permanently (five years or more) to grow herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land).

**References**

Pain B. and Menzi H., 2003: Glossary of terms on livestock manure management 2003. RAMIRAN Network, 59 pp. Copies available from: H. Menzi, Swiss College of Agriculture, Laenggasse 85, CH-3052, Zollikofen, Switzerland.  
[harald.menzi@shl.bfh.ch](mailto:harald.menzi@shl.bfh.ch)

Definitions of agricultural words can be found in the FAO glossary  
<http://faostat.fao.org/>

Albertsson, B., 2010. Riktlinjer för gödsling och kalkning (Guidelines for fertilizing and liming). Jordbruksverket Jönköping. 84 pages. [www.sjv.se](http://www.sjv.se)