



**Interreg**



**Danube Transnational Programme**

**CAMARO-D**

# **Transnational best management practice (BMP) catalogue – GRASSLAND MANAGEMENT**

## **D. T 1.2.3**

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# 1 Introduction

Catalogue of Best Management Practices was created as a result of Interreg Danube Transnational Program project CAMARO-D, dealing with flood control, water quality and related questions of land management in Danube catchment.

Catalogue is presented in the form of four issues/handbooks, according to focus area in land management. The focus areas are:

- Agriculture – arable land;
- Agriculture – grass management;
- Forestry;
- Spatial Planning.

Prior the catalogue creation the BMP transnational synthesis had been worked out by CAMARO-D project in close cooperation of all project partners. The synthesis was the first catalogue input offering comparison of BMP use in Danube countries.

Then four international expert teams in above listed focus areas worked out final selection and qualified description of measures to be included in the BMP catalogue.

The catalogue therefore neither collects and assesses all practices, applied within water and landscape management in partner's countries, nor lists practices most often recently applied within individual Danube countries.

It summarizes most effective practices applied and practices rarely (or even not yet) applied, but which application is highly desirable in several Camaro-D countries. The authors are aware that there exists number of other practices that can be effectively applied within individual countries.

The list will never be complete, but catalogue tries to collect the most effective and most often implemented practices to share knowledge and experiences within Danube countries.

All four issues of BMP catalogue have standardized structure for better orientation and includes indicative criteria as frequency of recent implementation within individual countries, effectiveness and cost demand of general support from state, EU or other legislation.

According to the title the catalogue deals with Management Practices, but it describes also Technical Measures. Practice or Measure are understood generally as any activity, leading to improvement of water management within target area of Danube catchment.

Hopefully our target group consists of decision makers, land managers, stakeholders, and local authorities interested in Danube region landscape improvement.

## **1.1 List of Best Management Practices**

- Appropriate cattle load at pastures
- Manual mowing in vulnerable areas
- Appropriate distribution of pastures versus meadows
- Extensive meadows/pastures within vulnerable areas
- Permanent grassing of infiltration areas
- Proper pastures (grazing) management (feeding lots, drinking lots, weed control)

## 2 Best Management Practices - catalogue

### 2.1 Appropriate cattle load at pastures

Type of practice/measure		
Technical	Management	Other - specify
	<b>X</b>	

Description of practice/measure
<p>Grasslands are being replaced by urbanization and more profitable agricultural activities around the world. Producers may be faced with land constraints and need to consider intensification of the remaining grasslands as a means of maintaining overall production on a decreasing land resource. However, intensification of the grazing system is usually associated with greater nutrient inputs, including those from commercial fertilizers and supplement fed to animals. Excessive loading of nutrients in intensive grazing systems via fertilizer and animal wastes can cause nutrient buildup in the soil and subsequent water quality problems. Surface runoff and leaching of nutrients are the two major process affecting water quality. Nitrogen and P represent major nutrient concerns as related to water quality. Increased nitrate concentrations render groundwater unsuitable for drinking and can cause serious health issues for humans. Excessive N and P concentrations may contribute to eutrophication of streams and lakes. Maximizing efficiency of nutrient recycling through the soil-forage-animal system minimizes off-site nutrient transport and decreases production costs by reducing the quantity of commercial fertilizer needed. Management strategies to reduce soil and water contamination include refining the balance of nutrient inputs from feeds and fertilizers as well as accounting for the nutrients recycled through the decomposition of plant litter and animal wastes. The best management practices will supply reliable information for future environmental policies that may be adopted by governmental agencies.</p>

### Intended goals of practice/measure

Proper cattle density will provide mainly:

- Protection and good development of turf
- Nutrients and water retention of the parcel
- Good soil erosion prevention, therefore also water quality conservation

### Characteristics of practice/measure

The grazing time is up to 180 days in the hilly area and up to 130 days in the mountain area. Grazing in wet land meadows depends on site conditions, mainly in autumn.

2 – 2,5 LU (Livestock Unit adult cow 500 kg)/ha is standard load at intensive pastures, while for ecological agriculture load of 0,3 LU is required. Too low density can lead to unfavorable changes in plants species spectrum, too high density can lead to damages at soil cover and turf, led by soil erosion, nutrients losses, ...

Grazing in autumn on wet meadows without high stocking density prevents soil compaction or rutting due to the use of heavy machines for moving

In grassland areas, the autumn pasture consists mainly of valley meadows, two to four of which were previously harvested as hay or silage, and the rest of which is available to cattle until the onset of winter. The autumn willow produces less manure, so fertilisation is less intensive.

### Effectiveness in operation

Re-use us grassland areas, extensive agriculture with low input of fertilizers or other chemical substances (but needs control mechanisms, Funds (Agri Environment Programme), increasing of biodiversity and animal welfare through grazing,

<b>On soil conservation</b>	***
<b>On flood control</b>	**
<b>On water quality conservation</b>	**

<b>Costs</b>	
<p>Optimal load or grazing capacity expressed in UVM / ha for each category of grassland was also determined taking into account the grazing time, according to the formula:</p> <p>UVM optim/ha= <math>P_v / (D_p \times 65)</math>, in which:  <math>P_v</math>: total yield of harvested grass, expressed in kg / ha;  <math>D_p</math>: grazing time (days);  65: required kg green weight per day for 1 UVM.</p> <p>For example, after this formula, on a meadow sown in the hilly area of Romania, with a yield of 32 tons grass/ha over a period of 160 days, can be maintained with good results 3 UVM, respectively 3 dairy cows producing about 5,350 l milk/ha worth 1,123 € at the current purchase price, returning about 374 € milk value for a cow, of which 5% represents 19 €/head, such as grazing tax, which is not much at all. With data on grassland categories, production, loading and grazing time, grazing rates can be set more accurately on large-scale physical and geographic areas. Thus, according to this methodology, grazing fees vary between 5,25 and 6,72 €/UVM on alpine and sandy meadows, for a period of 60-100 days, up to 26,25 €/UVM on the sown and irrigated grasslands in the plain area, for a period of 180-200 days of grazing. In the fair assessment of taxes, there is some confusion about the equivalence between an UVM unit, species and animal categories. That is why we consider it necessary to use the transform coefficients in and from UVM.</p>	
<b>Investment costs</b>	**
<b>Operational costs</b>	**
<b>Economic losses of farmer</b>	***

<b>Potential problems/conflicts</b>
-------------------------------------

Regulation of grazing density shall be subject of state policy. Farmers tends to increase load of cattle on the pasture, while nature conservation (also soil and water conservation) interests tends to lower it to the minimum.

**Rate**

**\*\***

### Required or supported by CAP ?

Not at central level, limitations and requirements on national level.

### Required or supported by national implementation of Common Agricultural Policy?

Various parts of CAP EU (Common Agricultural Policy) has been displayed into national legislation through requirements to water quality, soil, biodiversity and landscape conservation. There are different programs in individual countries and requirements and formulation varies from country to country.

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
yes/no	yes			yes			yes		

### Applied in the country ?

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
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Select level:  *, **, ***				***			**		
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### Photos – if relevant



Only sample photo

## 2.2 Manual mowing in vulnerable areas

Type of practice/measure		
Technical	Management	Other - specify

	<b>X</b>	
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### Description of practice/measure

Autumn works applied on pastures are particularly important for preserving and/or improving the productive potential of grassland systems. These works are limited to mowing vegetal remains and spreading animal manure. Extensive meadows with high biodiversity require regular harvesting of biomass (during vegetation season). Manual mowing can be only way of their preserving.

### Intended goals of practice/measure

Use by mowing requires the knowledge of simpler conditions to be observed, such as: stage of plant development, cutting height and cutting, harvest removal, hay preparation, silage and more. Instead, grazing is much more complicated, as the animal factor by trampling, grass breakage, solid and liquid manure, etc., influences the productivity and floristic composition of the grassy rug of a meadow. Therefore, as much methods of use as the methods of improving the production of a meadow should be given, so as to obtain the expected results.

Once animals graze down most of the grass in a pasture to three inches, in addition to moving them to another pasture, it is often necessary to mow the just grazed pasture. Mowing after animals graze a pasture evens out the grass height, which promotes more even grass growth of all species during the recovery period. Mowing also encourages plants to produce more leaves and fewer stems, thus producing a more palatable, thicker, and hardy grass stand. Mowing also helps control some weed species. Mowing weeds, such as thistle, prevents them from going to seed, thus reducing the number of weeds later. Animals, such as sheep and goats, graze some weed species, particularly if the weeds are kept short, making them more palatable.

### Characteristics of practice/measure

Manual mowing is based on mowing (harvesting) of biomass by manual power or small machinery in conditions of difficult morphological or economic conditions. Manual mowing also means removal of rest of ungrazed biomass from pasture.

### Effectiveness in operation

Reel mowers love to gobble up grass and turn it into clippings, but some grass is downright unfriendly to mow. Grass that is ultra thick can form a heavy carpet on the ground that bogs down reel mowers and gums up their works.

It's still possible to mow these grasses with certain reel mowers. Not all reel mowers can handle thick grass, but push reel mowers with high ground clearance and adjustable blade spacing can do the trick. High ground clearance keeps the blades out of the thickest parts of the grass and prevents bogging down. Adjustable blades can be loosened so that there's a larger gap between the cutting blade and the back blade. Also, try mowing with only part of the mower over uncut grass. If the going is too tough, cut in narrower rows with more of the cutting area overlapping areas that have already been cut.

#### On soil conservation

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#### On flood control

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#### On water quality conservation

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### Costs

Rational grazing is an art which ultimately depends on the productivity and durability of the grassy carpet, as well as the yield of livestock expressed in live weight gain, milk, etc., achieved during the grazing season.

<b>Investment costs</b>	--
<b>Operational costs</b>	**
<b>Economic losses of farmer</b>	*

<b>Potential problems/conflicts</b>	
No problems occurs – as this measure follows interests of real farmers.	
<b>Rate</b>	no

<b>Required or supported by CAP ?</b>
No. CAP transforms this requirement to partial goals of biodiversity and landscape protection.

<b>Required or supported by national implementation of Common Agricultural Policy?</b>									
In many countries manual grass mowing has been supported not directly by CAP, but by other (linked) directives or programs – mostly linked to water quality or more often biodiversity and landscape conservation.									
Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
yes/no				yes			yes		

### Applied in the country ?

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
Select level: *, **, ***				*			***		

### Photos – if relevant



Only sample photo

## 2.3 Appropriate distribution of pastures versus meadows

Type of practice/measure		
Technical	Management	Other - specify
	<b>X</b>	

Description of practice/measure
<p>Management by mowing or grazing is essential to the maintenance of structure, balance and diversity in grassland. Without management grassland becomes coarse and rank, loses both diversity and interest, and will eventually turn into scrub or woodland.</p> <p>Meadows are areas or fields whose main vegetation is grass, or other non-woody plants, used for mowing and haying. Pastures are grassed or wooded areas, moorland or heathland, generally used for grazing. Due to their rooted soils and their permanent cover, meadows and pastures provide good conditions for the uptake and storage of water during temporary floods. They also protect water quality by trapping sediments and assimilating nutrients.</p> <p>The measure offers the potential for temporary flood storage, increased water retention in the landscape and runoff attenuation. Soil cover is maintained at all times with rooted vegetation, this reduces the surface flow of water and allows greater infiltration to the soil. Rates of soil erosion are considerably lower than arable land with potential benefits for water quality.</p>

Intended goals of practice/measure
<p>The goal is to provide optimum harvest of biomass/production of meat or milk on one hand and to provide as high soil conservation, water retention and water quality conservation as possible.</p>

### Characteristics of practice/measure

Parcels, accessible for machinery, with fertile soils are more effective to use as meadows, while less fertile land, steep, broken topography or for any other reason not effective for mechanization shall be used as pastures. Intensity of grazing shall correspond to soil and vegetation type – to keep turf in good shape. Meadows can be located at places, dedicated for flood wave spilling, while pastures are not suitable – due to both of risk for animals and potential flood water pollution by feces.

### Effectiveness in operation

The measure is mainly effective to protect soil quality, but due to good and stable vegetation, also water quality and water holding capacity.

#### On soil conservation

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#### On flood control

\*

#### On water quality conservation

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### Costs

There are no relevant costs or economic losses.

#### Investment costs

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#### Operational costs

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#### Economic losses of farmer

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### Potential problems/conflicts

Much attention has been placed on the potential negative environmental impacts of grazing; however, grazing can be a powerful tool for improving pasture health and productivity. This has been realized for many years. In fact, Aldo Leopold listed the ax, plow, cow, fire and seeding as potential renovation tools in the early 1900s. These tools have changed little over the years and are as effective today as in the early 20<sup>th</sup> century. Grazing diminishes the competitive ability of plants like broomsedge and johnsongrass and improves the competitiveness of bermudagrass, bahiagrass and even clovers. Improper grazing, on the other hand, can decrease the competitiveness of desirable species like orchardgrass or switchgrass and encourage undesirable weedy species.

### Rate

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### Required or supported by CAP ?

The application can have a great potential in the context of the European Union's Common Agricultural Policy (EU CAP), where one of the requirements for subsidy payments is regular mowing of the grasslands. So far, checks have mainly relied on inspectors, but field visits are expensive, time-consuming and can never cover the entire country. Applying satellite remote sensing for inspections is a logical technological step forward. This would also help to reduce manual labour while giving a more objective picture of the condition of agricultural grasslands throughout the EU.

### Required or supported by national implementation of Common Agricultural Policy?

CAP does not formulate particular requirements on spatial distribution of meadows and pastures.



Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
yes/no				no			yes		

### Applied in the country ?

In some countries, spatial distribution of meadows/pastures is partly determined by requirements on soil and mainly water conservation and also on retention capacity, to support flood control.

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
Select level: *, **, ***				*			***		

### Photos – if relevant



Only sample photo

## 2.4 Extensive meadows/pastures within vulnerable areas

The practice is closely linked to paragraph 2.1 Appropriate cattle load at pastures, which discusses limited load of animals to preserve turf quality and therefore water and soil quality.

Type of practice/measure		
Technical	Management	Other - specify
	<b>X</b>	

Description of practice/measure
<p>A classically managed meadow grassland is one that is shut up for hay (grazing stock excluded) during the spring/early summer. In July the stock are returned to 'aftermath' graze, then light grazing continues until the end of the season – about November time. The best haymaking grasslands are normally found on neutral soils, as grass growth on thinner limestone and acidic soils is poorer, with finer swards better suited to pasturing. Particularly in dairy systems, many traditional meadows have been improved by addition of fertilizers to produce rapid grass growth for multiple-cropping and silaging.</p> <p>A pasture grassland is one that is normally grazed year-round, spring included, and not hay-cropped. The pasture may be 'rested' in winter to allow sward recovery and while stock are housed. Confusion often arises when pastures are referred to colloquially as 'meadows' because they may have been managed as such in the recent or historic past.</p>

Intended goals of practice/measure
<p>The goal is to set up only such management, which will lead to sustainable exploitation without damages on turf and soil, changes of vegetation species and risk for water quality. This is especially necessary in locations with high slope, shallow soils, low fertile soils, high ground water level or any other "extreme" conditions.</p>

### Characteristics of practice/measure

Extensive operation of Meadow/pasture is set up within vulnerable areas. It means mainly to limit application of fertilizers to resign attempt of highly intensive grass species, to decrease intensity of grazing and decrease load of cattle. All mentioned activities are technically possible and will lead to increase of income of farmers, but bring high risk of water pollution, surface soil depletion or biodiversity decrease.

### Effectiveness in operation

The measure is very effective in soil and water quality conservation. It is effective also in generally ecological meaning (biodiversity etc.)

#### On soil conservation

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#### On flood control

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#### On water quality conservation

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### Costs

Costs can hardly be expressed in currency, but there are mainly operational costs and economic losses of farmers, due to decrease of intensity of production. If Ecosystem Services are included, economic assessment would change dramatically, as main effects of measure are ecological ones.

#### Investment costs

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#### Operational costs

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<b>Economic losses of farmer</b>	***
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<b>Potential problems/conflicts</b>	
The measure is potentially problematic mainly due to economic losses of the farmer. Therefore, if those losses are balanced by any kind of state subsidies, it is very attractive measure.	
<b>Rate</b>	**

<b>Required or supported by CAP ?</b>
The measure is supported generally mainly by EU documents, dealing with nature and water quality conservation – i.e. nitrate directive (91/676/EHS).

<b>Required or supported by national implementation of Common Agricultural Policy?</b>									
On the national level it is required and supported, as one part of Common Agricultural policy EU - Cross Compliance – within paragraphs and directives, dealing with water quality, soil quality and landscape and its biodiversity control.									
Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
yes/no				yes					

<b>Applied in the country ?</b>
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Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
Select level: *, **, ***				**					

#### Photos – if relevant



Only sample photo

## 2.5 Permanent grassing of infiltration areas

Type of practice/measure		
Technical	Management	Other - specify

	X	
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### Description of practice/measure

Infiltration depends on there being sufficient porosity in the surface soil for rainfall to infiltrate, and in the subsoil and parent material (if shallow) for rainwater to percolate. When the porosity of the surface soil is too low to accept rainfall, or subsoil porosity is too low to allow rainwater percolation (i.e. permeability is too slow), then infiltration will be restricted and rainwater will be lost as runoff.

The porosity of surface soil may have been reduced by clogging of pores with particles detached from soil aggregates under the impact of raindrops, or by the deposition of detached particles on the soil surface as impermeable crusts or seals. The porosity of subsurface soil may be naturally low, or may have been reduced by compaction and tillage practices that have disrupted or destroyed pore spaces causing a zone of low permeability at the base of the tilled layer. The degree to which soil porosity is reduced by tillage is frequently sufficient to limit root penetration, but is less often so severe that permeability to water is significantly diminished.

The overriding approach should be to instill in society, and in farmers and researchers in particular, they will have to create and sustain soil conditions that encourage the infiltration of rainfall where it falls, and to counteract the causes of runoff (Jonsson *et al.*, 1999). This implies that the porosity of the soil must be at least maintained, or increased.

A residue cover absorbs most of the energy of the raindrops that fall on it and by the time this rainwater reaches the soil below, its ability to disintegrate soil aggregates and detach fine particles is greatly reduced. Consequently, there is little or no clogging of surface soil pores by detached particles, and little deposition of soil particles that would form a crust on the surface.

The benefits of a residue cover are most apparent on soils initially in reasonable physical condition, but even under these conditions runoff can sometimes occur despite a good soil cover. For example, runoff will occur when rainfall intensity is greater than the soil's infiltration rate, or when the soil's pore spaces are already filled with water because the soil is shallow, its water holding capacity is low, or its subsoil is only slowly permeable.

When a residue cover is applied to a soil with a very degraded surface of low porosity, the beneficial effect of the cover on infiltration may be initially limited. In such situations, it is advisable to accelerate the recuperation of surface porosity before applying residue covers by tilling the soil once to break-up the crust and any subsurface pans, followed by a fallow period under a cover crop to enhance the formation and stabilization of soil porosity. Annex 9 provides a list of publications about cover crops.

Permanent grasslands and farming systems linked to them have a great diversity in Europe and can differ between the main agro-climatic zones. Therefore, the practices to improve efficiency and productivity and/or their influence on biodiversity conservation or carbon footprint may vary according to that diversity. In order to structure the work of the Focus Group a classification is proposed in which the different vegetation composition of

grasslands and the farming systems are categorized.

### Intended goals of practice/measure

The goal is to cover important infiltration areas with permanent vegetation cover, providing filtration and retention effect for surface water to transform it into subsurface one. Permanent, well maintained extensive grass (preferably meadow) provides much better qualitative control for infiltrating water than arable land, due to limited, or generally neglected amount of fertilizers and pesticides.

### Characteristics of practice/measure

Principle consists in permanent grassing (preferably meadow) of the area, which has been identified as infiltration one. Ideally, grassed area is managed as extensive one. Such management/measure will lead to decreasing of surface runoff and positive affect on infiltrating water quality.

### Effectiveness in operation

The measure is very effective in the meaning of water quality, due to filtering effect of grassed surface and also absence of agricultural chemicals. Secondary positive effect is also on soil conservation due to extensive exploitation.

#### On soil conservation

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#### On flood control

\*

#### On water quality conservation

\*\*\*

Costs	
Costs are related only with conversion of arable land to permanent grass (if relevant) and then with economic losses of farmers due to decrease of production and extensification.	
Investment costs	*
Operational costs	*
Economic losses of farmer	**

Potential problems/conflicts	
<p>Potential problems are related to:</p> <ul style="list-style-type: none"> <li>- Economic losses of farmers due to conversion from arable land to permanent grassland (if applicable)</li> <li>- Economic losses related to extensification of exploitation</li> <li>- Potential problems related to operation of the farm – if farmer is able to exert biomass on one hand and does strictly need some products from arable land (silage, energy biomass, ...)</li> </ul>	
Rate	**

Required or supported by CAP ?
<p>The latest definition of permanent grassland/pastures was included in the Regulation N° 1307/2013 published the 17th of December 2013, where permanent grasslands and permanent pastures are defined in Article 4 as the “land used to grow grasses or other herbaceous forage naturally (selfseeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for five years or more, it may include other species such as shrubs and/or trees which can be grazed provided that the grasses and other</p>



herbaceous forage remain predominant as well as, where Member States so decide, land which can be grazed and which forms part of established local practices where grasses and other herbaceous forage are traditionally not predominant in grazing areas; Within the frame of this Focus Group and regarding the type of vegetation and farm, “Permanent grasslands” will be referred to as “any land/vegetation that can be grazed” independently of the type of vegetation (more or less herbaceous), the type of animal (cow, sheep, goat, horse...) or the type of farming system (intensive/extensive; meat/milk...). The definition of permanent grasslands includes herbaceous and also non-herbaceous permanent pastures which provide essential forage in many extensive livestock systems, especially in more marginal regions. Those systems provide multiple key ecosystems services in some of Europe's most bio-diverse habitats (e.g. heathlands, Montados or Dehesas, northern woodlands grazed reindeer, etc.), reducing fire risks, maintaining open landscapes and cultural heritage.

### Required or supported by national implementation of Common Agricultural Policy?

Supported by EU Drinking water directive (98/83/ES), EU Groundwater directive (2006/118/ES) and directive linked to CAP – Cross Compliance and their national implementations.

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
yes/no				yes			yes		

### Applied in the country ?

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO

Select level: *, **, ***				**			**		
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**Photos – if relevant**

Only sample photo

## 2.6 Proper pastures (grazing) management (feeding lots, drinking lots, weed control)

Type of practice/measure		
Technical	Management	Other - specify
	<b>X</b>	

Description of practice/measure
<p>Pasture management should be thought of as grass farming. Think of the grasses as your crop, while you use animals to harvest that crop. If pastures show characteristics representative of poor pasture management, there are five steps you can follow to improve and better manage your pastures: conducting an inventory, creating a sacrifice area, implementing rotational grazing, mowing and harrowing, and proper fertilizing. Important part of the practice is appropriate load of animals at the parcel – this is however exclusive topic of paragraph 2.1 – Appropriate cattle load at pasture.</p>

### Intended goals of practice/measure

Good pasture management are represented by following:

- Sacrifice area set up for animals during rainy season
- Several smaller, lush pastures and few, if any, weeds
- Animals fenced away from streams, ditches or other water bodies
- Few, if any, areas of bare soil exposed

Therefore, the goal of this practice is manage the grazing process the way to avoid intensive contact of animals with water bodies, serious damages of turf, long term (permanent) concentration of feces at one place and massive damages at trees and bushes caused by animals. Expected effect is water quality conservation, soil protection and prevention of accelerated surface runoff of rainwater. Side effect is also nature and landscape preservation and biodiversity control.

### Characteristics of practice/measure

The measure consist of:

- Proper management of drinking lots and feeding lots (ideally located at flat part, mechanically stabilized surface, no spilling of flowing water, feeding shall be distributed at more spots over pasture)
- No winter stay of cattle at the pasture, where normally (special winter pastures, where turf shall be recovered during vegetation season)
- Feces should be periodically distributed over the parcel
- Regular mowing of not-grazed plants (especially weeds)
- Proper management of grazing – only proportional part of pasture available at once, to graze effectively, the fence shall be moved periodically and grazed part shall have ca 3 weeks for recovery

Effectiveness in operation	
The measure is very effective in soil and water quality conservation. Good turf prevents direct accelerated surface runoff – therefore it also increases water retention capacity.	
On soil conservation	***
On flood control	*
On water quality conservation	***

Costs	
Costs are related mainly with lower effectiveness of production, as additional manual power is necessary for operation. Little investments are also necessary to provide infrastructure of pasture. No economic losses are expected.	
Investment costs	*
Operational costs	**
Economic losses of farmer	---

Potential problems/conflicts	
There are no conflicts expected.	
Rate	---

**Required or supported by CAP ?**

Carbon sequestration in agricultural soils is accountable under Article 3.4 of the Kyoto Protocol (additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land use change and forestry categories). The Bonn Agreement formulated at COP6bis in July 2001 clarifies the implementation of Article 3.4 as follows: In the context of agriculture, eligible activities comprise "cropland management", "grazing land management" and "revegetation" provided that these activities have occurred since 1990, and are human-induced. The Marrakech Accord agreed at COP7 in November 2001 sets legally binding guidelines for reporting and accounting for agricultural carbon sinks. For activities under Article 3 paragraphs 3 and 4 the following definitions and rules apply (FCCC/2001/13).

CAP EU defines requirements of cattle density in its Cross Compliance system, the same as Nitrate Directive (91/676/EHS).

#### Required or supported by national implementation of Common Agricultural Policy?

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
yes/no				yes			yes		

#### Applied in the country ?

Country	AT	BG	HR	CZ	D	HU	RO	RS	SLO
Select level:				**			**		

* , ** , ***									
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## Photos – if relevant

Only sample photo