

EXECUTION OF A SPECIALIZED STUDY IN ORDER TO DRAW UP THE DOCUMENTATION FOR THE REALIZATION OF THE PASTORAL ARRANGEMENT IN VARADIA COMMUNE, CARAS - SEVERIN COUNTY

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Abstract

The permanent meadows in our country have a spread of about 4.9 million hectares, Romania occupying the fifth place in Europe after France, Great Britain, Spain and Germany. The meadows in our country, which represent 33% of the agricultural area, constitute a part of the national wealth, which is of major importance for the size of the foraging resources and their quality, as well as for the other functions having a beneficial effect on the protection and the beauty of the environment. Meadows are an essential element of sustainable farming systems, which meet the demands of healthy and high-quality food. In addition to the decisive role of providing feed for animal feed, meadows have an important role in rural development and the reflected environment through: conservation of biodiversity, improvement of soil fertility, symbiotic fixation nitrogen, hydrological balance, prevention of floods and landslides, carbon sequestration, landscape quality and important cultural heritage. Sustainable development is a complex process that runs through and below human intervention, aimed at the development of society, its materialization being based on the fact that the sustainable development of the whole is ensured by the sustainable development of each part of human activity. Management of the meadow belonging to a locality is the way in which the management of a meadow is ensured, and the organization and exploitation of the permanent meadows (according to Government Emergency Ordinance – OUG No. 34/2013), respectively (O.U.G. no. 34/2013). The guidelines for optimal management of different types of pastures are also dependent on the specific objectives and their main points are: timing and cutting technique, number of grazing animal feed per hectare in different types of meadows, chemical impurities depending on the type of soil , the presence of weeds or invasive species.

Key words: settlement, management, animals, production, shepherd.

INTRODUCTION

The study for the realization of the pastoral arrangement includes the presentation of the issues under all the relations that concern the pastoral economy and presents the possibilities for improvement of the meadows throughout its validity.

It contains a specialized technical-scientific documentation for the elaboration of prospective plans in relation to the actual production possibilities of the pastoral fund. The way of management of the meadows belonging to a locality is the way in which the management of a meadow, namely the

organization and exploitation of the permanent meadows (according to the Emergency Ordinance of the Government – OUG No. 34/2013), is ensured.

All problems and their solutions will have to be included in the "pastoral plans" of the permanent meadows, as well as by the local public administration's compliance with the obligations stipulated by the law in this field

In Romania, the legislation on the use of pastures is represented by the Law (OUG) no.34 / 2013, in which the areas cannot be reduced and they operate only on the basis of a management plan. Also very important for farmers, the rental period is 7 to 10 years,

which creates an increased responsibility for farmers and also gives them the opportunity to use the funds received through APIA to increase soil fertility and fund management pastoral as his own.

Pasture management and the environment are now integrated into rural policies in Europe. Meadows are an essential element of sustainable farming systems that meet the demands of healthy, high-quality food demand. In addition to the decisive role of animal feed, meadows has an important role in rural development and the environment, reflected by: biodiversity conservation, soil fertility improvement, symbiotic nitrogen fixation, hydrological balance, flood and landslide prevention, carbon sequestration, landscape quality and important cultural heritage.

For these reasons, proper management in mountain pastures is important for maintaining a continued use of this ecosystem to provide a source of life in rural communities. Permanent meadows are very important, they have been part of traditional farming for a long time. In the last ten years, Romanian farmers, for the purpose of applying correct forms of meadow and animal feed management, are looking for financial support from the European society. The partnership between agriculture and nature protection has to face many challenges related to meadows management (Barliba, 2011).

MATERIALS AND METHODS

The pastoral arrangement aims to apply correct management of meadows administered by the U.A.T. Local Council. Varadia, this is a multifunctional objective that ensures elements such as:

- applying a proper management practice, eliminating under and over grazing,
- the elimination of continuous grazing that causes erosion processes, soil shedding, green mass production depreciation and lowering of the quality;
- stopping the proliferation of non-fodder species, weeds, invasive and toxic species;
- stopping the growth of shrub vegetation;
- stopping erosion processes;
- increase of pastoral value of meadows, increase in production and load with UVM / ha;

- increasing the welfare of rural communities in the high and pre-mountain hills where the main source of income is agro-zootechnical.

From an ecological point of view, a rational and controlled exploitation of these meadows leads to an increase in the biodiversity of the vegetal carpet and the protection and soil degradation.

The meadows surveyed were located in the Varadia and Mercina localities, located in the South-West of Caras-Severin County, on the border with Serbia, on the banks of the Caras River. In the commune it enters a secondary road, which departs from the road Timisoara-Oravita, near the village of Greoni (www.primariavaradiacs.ro).

Varadia commune covers an area of 7345 ha, of which 6499 ha represents the agricultural land (Figure 1).



Figure 1. Orthophotomap

The area of the commune falls into the Oravita depression, which is the southernmost low relief area on the Carpathian region of the western part of the country, being a hilly and flattened region, mainly on the river basin of the Caras river.

From climatic point of view, it is temperate-continental moderate with an average annual temperature of 11.5°C and the average multiannual precipitation value is 680.00 mm (Meteorological Station Varsset, Serbia) oscillating according to the relief, with lower values in the meadow area and higher in the piedmont hills.

(<https://sites.google.com/site/comunavaradia/>)

The climate of Varadia commune corresponds to the phytochemical area in which, with determined Mediterranean local influences, both the circulation of hot air masses coming from the South (Mediterranean) and the geomorphological units (usually slopes with different degrees of inclination and exhibitions miscellaneous).

The commune's area is located in the Forest Area, below the sessile area. The *Quercus robur* and the *quercus frainetto* predominate in the meadows and the lower fields and *Quercus petraea* (sessile) on the higher terrains (Bostan et al., 2014).

The characteristic note in all forest remains is the presence of thermophilous species, among which *Tilia tomentosa* (lime). There are also species such as *Fraxinus excelsior* (lime) *Fraxinus excelsior* (ash) si *Fraxinus ornus* (flowering ash), *Acer campestre* (maple) and *Acer tataricum*, *Pirus piraster* (wild hair) *Cerasus avium* (Cherry tree) *Rosa canina* (brier) *Prunus spinosa*.

On some eroded verses and on skeletal soils there are species such as *Ailanthus glandulosa*, *Botriochloa ischaemum*, *Poa pratensis*, *Fragaria viridis* (strawberries).

The meadows are developing associations *Agrostis capillaris* (the grass of the field), *Elymus asper* (lyme grass), *Botriochloa ischaemum*, *Cynosurus cristatus*, *Festuca pratensis* (fescue), *Xeranthemum annum*, *Setaria glauca*, *Rubus caesius* (blackberry), *Cirsium arvense* (pelamid), *Cynodon dactylon* (thick pir).

Altitude, exhibition and slope of U.A.T. Varadia, are rendered according to the Amenajistic Meadow Units, being between 95-115m high, with predominantly south-western exposure and 1-3% line slopes (Figure 2).

For the floral characterization of the meadows the phytosociological (geobotanic) method and the double meter method were used to determine the production and loading with the animals. Repeated mowing method was used in pasture cages (Dragomir et al., 2005). Determination of pedo-agrochemical characteristics of soils for meadows in order to establish the fertilization plan was carried out by OSPA Timis.

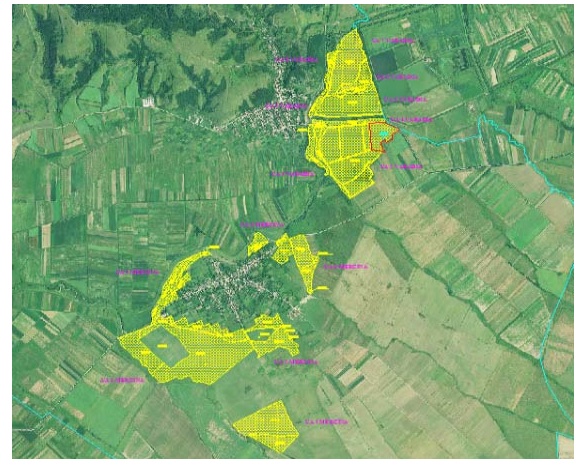


Figure 2. U.A.T. Varadia parcels of settlement

Each of the two methods used is designed to analyze, identify and rank plant associations as fundamental units of the vegetal carpet and is based on the use of a digital scale of visual appreciation of abundance. Stages of application: land recognition, location of reveals, determination of surface size, observation.

The essential part of the lifting is the elaboration of the floral inventory, or the phytosociological report, which, besides the list of species encountered, must also reflect the structural features of the vegetation expressed in percentage or by the use of conventional numerical scales.

The collection of data to identify the different types of plant communities (associations) was envisaged, in this sense phytosociological study methods (geobotanic method and double meter method) were used.

The vegetation analysis aims at identifying the influence of abiotic factors, but also the evolution of vegetation in terms of anthropogenic influence, namely the management of exploitation and the presence or absence of care work on the respective surface (Marriott et al., 2004).

The way of management of a permanent meadows area influences the direction of evolution of the floristic structure and its vegetation dynamics.

RESULTS AND DISCUSSIONS

On the UAT meadows surface Varadia is practiced grazing continuously and extensively free type. It has not been observed on any of

the meadows surfaces the realization of rational pasture (by rotation) on parcels clearly delineated by conventional or electric fences. Also, no grazing has been observed that respects different lunar times for restoring the vegetal carpet.

Continuous (free) grazing - according to this system, the animals are allowed to grazing in spring pasture until late autumn, so-called selective grazing is practiced.

The practice of this system is associated with areas where green mass production is small, unevenly distributed over grazing cycles; the summer drought period leads to a decrease in production in cycles three and four.

Under the current conditions, from the meadows vegetation study, we do not recommend parcels through permanent fencing due to fragmentation of the terrain, the incline of the sea, and the production of meadows is too small to justify economically.

However, in the next few years, after all the meadows improvement works are done, some meadows with flat land conformation can be traced back to a rational pasture (Figure 3).



Figure 3. UAV View of the area

Practicing rational pasture by the division of pasture bodies into plots (8-12 parcels), delimited with an electric or permanent fence. Where this is not possible, we recommend practicing a rational grazing without straining, using the natural boundaries (forest ridge, canal, access roads) as parcel limit. Returning on the same surfaces after a period of 25 -30 days.

Grazing with the animals in front by a shepherd that allows them to advance only to the extent of sufficient planting.

Herd management on a certain route, which changes from time to time, so the animals are

not in the same place, but grazing on different places on the same day and on other days.

Thus, U.A.T. permanent meadows Varadia located in the subcolinated Plain area according to the "Classification of the meadows in Romania" (Marusca et al., 2014), are located in the immoral area, Subsoil of oak forests, thermophilic submesophiles, spreading in the low and high plains of Muntenia and Oltenia, pine monks in Banat and Crisana, at altitudes between 100 - 200 m, these meadows are installed on loessoid deposits, clays, gravel, T = 9 - 10,5oC, P = 500 - 700 mm Hg, on soils of the clay-clay chernozem type (Samfira e al., 2011).

In the case of these meadow areas, the following meadow types and subtypes have been identified and classified according to the methodology in force: the series of meadows - *Festuca valesiaca*, *Festuca rupicola* (West of Romania), the dominant type of meadows is *Festuca valesiaca* + *Festuca rupicola*, subtypes of meadows *Festuca rupicola* + *Agrostis capillaris* + *Botriochloa ischaemum*, meadow, has a width that varies between 20 m in the East and 900-2000 m, in the West part of the territory, to this formation is added the meadow of the Mercina river, relatively narrow, even if at the confluence with the river Caras is width somewhat larger, ranging from 100 to 200 m.

Thus, U.A.T. permanent meadows Varadia located in the meadow area according to "The typological classification of the meadows in Romania" (Samfira et al., 2007), are classified as meadows and depressions, spreading in the Romanian Plain (Buzaului, Ialomita), Siret Alluvial Plain, Western Plain (Banat, Crisana), Plateau of Moldavia, local in Transylvania, alluvial soils, vertisols, salinized or leached, solonts and aquisalids, on surfaces of 50000 ha. In the case of these meadow areas, the following meadow types, types and subtypes have been identified and classified according to the methodology in force: Meadows series: *Dechampsia caespitosa* - *Puccinellia limosa*, dominant meadows type *Festuca arundinacea* + *Beckmania eruciformis*, *Festuca arundinacea* subtype + *Botriochloa ischaemum* + *Beckmania eruciformis*.

Table 1. The main types of permanent meadows of U.A.T. Varadia and their bonitation through Pastoral Value

Nr. crt.	Nr. tarla	Nr. parcell	Meadow type and subtype/ Pastoral Value	S ha
1.	Ps 1102	30411	Types of meadows: Festuca arundinacea + Beckmania eruciformis, Subtypes of meadows: Festuca arundinacea + Botriochloa ischaemum + Beckmania eruciformis. VP = 47,36	3.07
	Ps 101	30407		0.88
	TOTAL UA1 VARADIA			3,95 ha
2.	Ps 101	30408	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Festuca rupicola + Agrostis capillaris + Botriochloa ischaemum VP = 42,15	1.60
	Ps 1102	30400		2.98
	Ps 1108	30399		9.02
	Ps 1107	30401		45.32
TOTAL UA 2 VARADIA			58,92 ha	
3.	Ps 100	30406	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Festuca rupicola + Agrostis capillaris + Botriochloa ischaemum VP = 42,15	4.06
	TOTAL UA 3 VARADIA			4,06 ha
4.	Ps 98	30409	Types of meadows: Festuca arundinacea + Beckmania eruciformis, Subtypes of meadows: Festuca arundinacea + Botriochloa ischaemum + Beckmania eruciformis. VP = 47,36	1,28
	TOTAL UA 4 VARADIA			1,28 ha
5.	Ps 98	30404	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Botriochloa ischaemum + Thymus zygoides + Calamagrostis villosa, VP = 67,16	21.27
	Ps 95	30405		2.15
	TOTAL UA 5 VARADIA			23,42 ha
6.	Ps 95	30402	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Botriochloa ischaemum + Thymus zygoides + Calamagrostis villosa, VP = 67,16	5,84
	TOTAL UA 6 VARADIA			5,84 ha
7.	Ps 93	30403	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Botriochloa ischaemum + Thymus zygoides + Calamagrostis villosa, VP = 67,16	21,85
	TOTAL UA 7 VARADIA			21,85 ha
8.	Ps 93	30410	Types of meadows: Festuca arundinacea + Beckmania eruciformis, Subtipul de pajiste: Festuca arundinacea + Botriochloa ischaemum + Beckmania eruciformis. VP = 47,36	2,18
	TOTAL UA 8 VARADIA			2,18 ha
9.	1260	30425	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Agrostis	6.89
	1262	30422		21.35

			capillaris + Botriochloa ischaemum + Lolium perenne VP = 58,16	
TOTAL UA 1 MERCINA				28,24 ha
10.	Ps 1283	30182	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Agrostis capillaris + Botriochloa ischaemum + Lolium perenne VP = 58,16	10.19
	Ps 1277	30181		4.77
	Ps 1274	30179		4.87
	Ps 1279	30420		0.08
	Ps 1281	30417		0.03
	Ps 1281	30421		0.21
TOTAL UA 2 MERCINA				20,15 ha
11.	Ps 1273	30185	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Agrostis capillaris + Botriochloa ischaemum + Lolium perenne VP = 58,16	4.71
	Ps 1287	30180		1.42
	Ps 1287	30183		4.82
	Ps 1265	30174		51.08
	Ps 1265	30173		12.00
TOTAL UA 3 MERCINA				74,03 ha
12.	Ps 1049	30418	Types of meadows: Festuca arundinacea + Beckmania eruciformis, Subtypes of meadows: Festuca arundinacea + Botriochloa ischaemum + Beckmania eruciformis. VP = 47,36	3.87
	Ps 1049	30419		3.36
	Ps 1231	30423		1.44
	Ps 1231	30424		2.05
	Ps 1231	30426		0.32
TOTAL UA 4 MERCINA				11,04 ha
13.	Ps 1221	30430	Types of meadows: Festuca arundinacea + Beckmania eruciformis, Subtypes of meadows: Festuca arundinacea + Botriochloa ischaemum + Beckmania eruciformis.. VP = 47,36	0.72
	Ps 1221	30427		2.64
	Ps 1221	30429		0.56
TOTAL UA 5 MERCINA				3,92 ha
14.	Ps 1197	30416	Types of meadows: Festuca valesiaca – Festuca rupicola, Subtypes of meadows: Agrostis capillaris + Botriochloa ischaemum + Lolium perenne VP = 58,16	0.11
	Ps 1206	30432		3.57
	Ps 1208	30415		0.54
	Ps 1209	30431		7.90
	Ps 1260	30425		4.61
TOTAL UA 6 MERCINA				16,73 ha

Setting the grazing period:

One of the most important parts of pasture management is the grazing period (Sheath et al., 2001).

Meadow areas can be grazed using the following categories of animals: sheep, goats and cattle, and mowing to produce hay.

The duration of the grazing season for U.A.T. permanent meadows Varadia, must be respected as follows:

For pastures grazed by cattle, grazing will take place over a period of 145-150 days, for the period 1 May to 30 October (it must be concluded three weeks before the first frost days), 180-190 days.

For pastures grazed by sheep, grazing will take place for a period of 145-150 days, for the period 20 April-30 October (it must be completed three weeks before the first frost days) and 190-200 days.

The animal food load on a meadow or the grazing capacity is expressed in UVM (large beef unit) / ha. It is a tool for correlating the actual production of a animal food surface.

The grazing capacity and the optimal animal food load per hectare are calculated, for each Amenajistic Unit, in accordance with the methodology laid down in Order 544/2013, art. 8.

The actual grazing capacity (UVM/ha), depending on the available green meal production, the grass rate and the daily grass consumption during the grazing season (180-190 days).

The grazing capacity was established in accordance with the Guidelines for the preparation of pastoral arrangements and according to the rules of the Ministry of Agriculture and Rural Development, established by Order no. 544/2013 on the methodology for calculating the optimal animal food load per hectare of meadows, which entered into force on 28.06.2013.

Determination of grazing load:

For permanent meadows in UA.T. Varadia, Varadia locality comprising UA 2 and UA 3 Varadia, with an estimated available production of 7000 kg / ha green weight, a 90% use ratio, a daily green weight of at least 50 kg / day / 1UVM and the duration 190-day grazing season:

$CP = (P.d. \times C.f.) / (C.i. \times Z.p. \times 100)$, in which $CP = (7000 \times 90) / (50 \times 190 \times 100) = 0,66$ UVM/ha/an.

Under the conditions of the value of $CP = 0,66$ UVM / ha, the number of animals, by species and age categories, which can be planted per hectare of pasture is:

-0,66 dairy cows;

-0,73- 0,80 cattle of all ages;

-2,17- 3,3 young cattle under one year;

-4,90 sheep or goats of all ages;

-0,80 horses of all ages;

-0,91- 0,99 youth cabal;

(Dorin et al., 2002).

To improve the U.A.T. Varadia is recommended to combat unconsumed species of pasture animals, repeated mowing and releasing the land from vegetal remains.

This operation is mandatory after each grazing cycle, and especially before the unwanted species can harvest, thus avoiding their proliferation.

Mandatory, in the spring before entering the animals on the pasture, mowers are cleared.

The fertilization of meadows is done by the following methods: organic fertilizers, by dragging, which represents a way of fertilization of meadows that run directly with animals and with chemical fertilizers.

On the U.A.T. Varadia gassing areas there isn't a water source for animals. Small springs with low flow rates that are dry in dry periods are present. No UAT water drills have been noticed for the animal's water supply. For animal welfare, it is important to ensure water supply on the pasture.

The arrangement depends on the water source. The most appropriate is the use of natural water sources (rivers, springs, wells). It is known that yields from animals are greatly influenced by the quality and quantity of water.

Generally, animals drink plenty of water, the quantities consumed are conditioned by several factors. Thus, the heavier the animals and the higher the milk yield, the more water they consume. Also, water consumption is closely related to the ingested dry substance content. Typically, for 1kg SU ingested, cattle need 4-5l of water, and sheep and horses of 2-3l of water. When watering is done in rivers, a portion of the river should be arranged where the animals have access without being endangered by injuries. That portion should be crushed to prevent it.

If water is fed into permanent water gutters from springs, (whose flow must be higher than the water consumption of animals), the site must be paved and laid down with a slope also to prevent landslide.

All gullies (gutters) are also made when watering is made from fountains. When

building water-drinkers, some elements need to be taken into account to ensure that the watering is carried out in good condition and as quickly as possible.

Within the U.A.T. Varadia does not exist for all source water bodies in the form of wells or jungle fountains.

It is recommended to organize water sources by collecting springs or drilling wells on meadows where there is no water source, annual water source check: wells, natural water sources; before the animals enter the pasture, the gutters must be repaired and disinfected; the annual source of water (gutters) serving the lawns; drilling fountains where appropriate.

At each meadow there must be an access road on which automated and mechanized means can circulate in order to perform in the spring-summer-autumn season all necessary transports, including the walking of animals to and from the pasture .

Zoo pastoral constructions are required for staff serving the animals, they can be used to build residential buildings attached to other zoo pastoral buildings, stables, stables, summer camps, huts, or special sanctuaries (Figure 4.).



Figure 4. Zoo pastoral constructions

Such types or models of dwellings or shelters may vary from one floor to another, by area, by the number of people to live in, and by the type and number of animals serving them. It is desirable that such dwellings retain architectural integrity of the local specificity.

Sheepfolds are buildings where milk and cheese are prepared, and where shepherds live during the summer.

The construction is placed near the water source or consider the possibility of bringing water to the sheepfold by piping or drilling

fountains. The location of the stall is also linked to the existence of an access way, road or trail. From the sheepfold, as far as possible, be a wide view of the pasture body. The ditch rests with its back to the dominant wind and north or northeast, northwest cellar, because it is necessary in this room to be constantly cool, not to be in direct sunlight. At the sheath and around it a great cleanliness is always required (Tarau et al., 2002).

The activity of the sheep-milking sheepfold is related to the so-called lathe, the milking facility and the separation of the milking sheep from the non-milking sheep.

It is considered that the fixed lathe system is not good because it is too much in one place to completely destroy the vegetation and to grow only the nitrofile weeds.

The lathe must also be moved every other 2-4 days to another place, all the meadows near the stallion being fertilized by dragging, by moving the lathe.

For workers working to improve the meadows, shelters are built, taking into account the number of years in which work will be done with an increased number of workers and the destination to be given shelter (it will remain as such or become a warehouse, shelter for bullocks, bullocks or cows before calving.

Generally, in the plain / hill area, dwellings for humans are not arranged in the meadows, workers working on the meadow in the return to their village homes in the evening. Exceptions are the shepherds who stay overnight with the heard.

The arrangement of the wardrobes, shelters, dwellings and shelters for careers, where necessary and desired, is recommended, redevelopment and disinfection of the stables, summer camps, where appropriate, the setting up of the lathe (for milking purposes).

CONCLUSIONS

This paper presents a model of pastoral arrangement for meadows managed by a Local Council in Caras Severin County, which was built for an area of 275.61 hectares.

For mountain meadows, the most important function is the productive function in a direct relation to the animal food load per hectare, but these functions are related to other aspects such

as: meadows biodiversity management, mountain subsidence, climate change. For these reasons, proper management in mountain pastures is important for maintaining a continued use of this ecosystem to provide a source of life in rural communities.

Over the past ten years, Romanian farmers have been working to implement correct forms of meadows management and increase the guidelines for optimal management of different types of pastures also depend on the specific objectives and have as main points: timing and cutting technique, the number of grazing animal food per hectare in different types of meadows, the chemical imputation depending on the type of soil, the presence of weeds or invasive species such as *Pteridium aquilinum*, the presence of specific fauna.

The management plan with all its components can further improve the stability of meadow ecosystems, increase plant and animal production and also increase the prosperity of the rural community.

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SECTION 03
CADASTRE

