# RESEARCHES CONCERNING THE PRODUCTIVITY OF SOME SANDY-LAND GRASSLAND FROM VALEA LUI MIHAI – BIHOR COUNTY

# CERCETĂRI PRIVIND PRODUCTIVITATEA UNOR PAJIŞTI PSAMOFILE DE LA VALEA LUI MIHAI – JUDEŢUL BIHOR

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***Abstract:*** *Grasslands are an important resource of Valea lui Mihai (Bihor County) they representing more then 22 % form the total agricultural land of the locality. Most of the grasslands are used under their natural capacity, because most of the times the lack of the maintenance works and the overexploitation or under exploitation are determining the reduction of the biomass yield. Usually the grassland surfaces that are closer to the settlements are overexploited and those that are farther are underexploited. The topic of this work is the productivity of some sandy land grassland from Valea lui Mihai (Bihor County). The purpose of this research is to reach pieces of information about the productivity of the analysed grasslands. Another aspect taken in account in this work is the pastoral value of the grasslands and the carrying capacity of the surfaces that are used for grazing. The data were collected from 4 grassland surfaces (Lenfin – hayfield, Fürkó, Dihenes and Urkuta – pastures) during 2007-2008. The research methods used in this work are measurement of the yield with the direct method respectively the method of the repeated mowing, and the determining of the carrying capacity per hectare of the grassland surfaces used for grazing. The harvests were grouped in three cycles and from every of the grassland were collected samples of fresh fodder from six plots. The results obtained in this research show that the grassland vegetation from the studied area has a great stability from the point of view of yield, and carrying capacity. The differences consist in the yield distribution on harvests, these being influenced by the repartition of the rainfall during the vegetation period. The number of the animals that are using the grassland is greater then the carrying capacity of the pastures used, and the forage deficit must to be provided from forage crops cultivated in arable land.*

***Rezumat:*** *Pajiştile sunt o resursă importantă a localităţii Valea lui Mihai (judeţul Bihor) acestea reprezentând mai mult de 22 % din totalul suprafeţei agricole a localităţii. Cele mai multe pajişti sunt utilizate sub capacitatea lor naturală, deoarece de cele mai multe ori lipsa lucrărilor de întreţinere şi supraexploatarea sau subexploatarea determină reducerea producţiei de biomasă. De obicei suprafeţele de pajişte care sunt aşezate mai aproape de aşezările omeneşti sunt supraexploatate iar cele situate mai departe sunt subexploatate. Subiectul acestei lucrări este productivitatea unor pajişti psamofile de la Valea lui Mihai (judeţul Bihor). Scopul acestor cercetări este să aducă informaţii despre productivitatea pajiştilor analizate. Alt aspect luat în calcul în această lucrare este valoarea pastorală şi capacitatea de păşunat a suprafeţelor utilizate prin păşunat. Datele au fost colectate de pe 4 suprafeţe de pajişte (Lenfin – fâneaţă, Fürkó, Dihenes şi Urkuta – păşuni) în perioada 2007-2008.metodele de cercetare utilizate în această lucrare sunt determinarea producţiei cu metoda directă, respectiv metoda tunderilor repetate şi determinarea capacităţii de păşunat pe hectar a suprafeţelor de pajişte utilizate prin păşunat. Recoltele au fost grupate pe trei cicluri iar de pe fiecare pajişte au fost colectate eşantioane de masă verde de pe şase parcele. Rezultatele obţinute în această lucrare arată că vegetaţia pajiştii din zona studiată are o mare stabilitate din punct de vedere al producţiei şi capacităţii de păşunat. Diferenţele constă în distribuţia producţiei pe recolte, aceasta fiind influenţată de ploile din timpul perioadei de vegetaţie. Numărul de animale care folosesc pajiştea este mai mare decât capacitatea de păşunat a păşunilor utilizate, iar deficitul de furaj trebuie asigurat cu ajutorul culturilor furajere cultivate pe teren arabil.*

***Key words:*** *sandy-land grassland, productivity, carrying capacity, pasture, harvests*.
***Cuvinte cheie:*** *pajişte psamofilă, productivitate, capacitate de păşunat, păşune, recolte.*

## INTRODUCTION

In the grazed and mowed grasslands the typical circulation of the nutritive elements is supported by the natural consumers through the great number of food chains realised by them. In their framework are kept the self-regulatory mechanisms providing the stationary state (PÂRVU, 2001; MIHAI, 2002). The productive grasslands are those that have a biologic potential enough for making efficient the technical measures that are applied on them. The productivity of the natural grasslands with increased biologic potential can be improved through technical measures that are concerning the humidity regime, soil fertility, the conditions for thatch formation (MOISUC *et* DUKIC, 2002; MOISUC *et al.*, 2001).

## MATERIALS AND METHODS

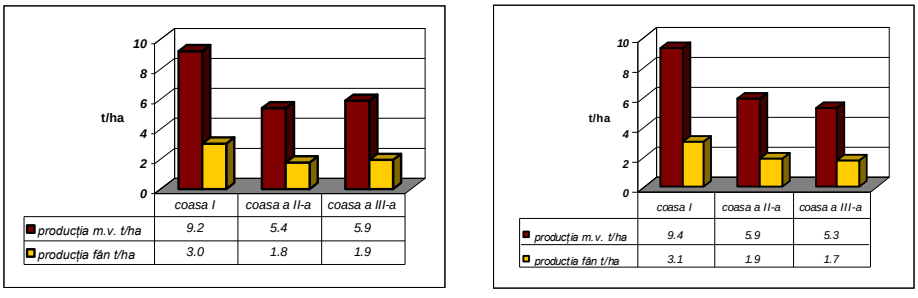
The studied material is represented by four grassland plots from Valea lui Mihai locality (Bihor County). Grasslands occupies there 420 hectares this representing 22.5 % from the agricultural surface of the locality Valea lui Mihai. These are grouped in the next plots:

- Lenfin – hayfield – 33.07 ha;
- Fürkó – pasture – 114.45 ha;
- Dihenes – pasture – 105.75 ha;
- Urkuta – pasture – 28.36 ha.

The data were collected during 2007-2008 period from six plots of one square meters from every one of those four grasslands. The yield was determined with the direct method of the repeated cuttings. Knowing the yield we can calculate the carrying capacity of the pasture this representing the number of animals that can be fed from a hectare of grassland. This number must to be the optimal.

## RESULTS AND DISCUSSIONS

In the case of Lenfin hayfield, as it can be seen in figure 1, the first harvest from 2007 represents about a half from the total yield of the year the other half being distributed on the harvest 2 and 3. The total yield calculated on those three harvests in 2007 was 20.5 t of fresh fodder. The hay yield obtained from this hayfield was determined through the multiplying with the transformation coefficient for grassland of *Bromus sp*. (0.33). Thus the hay yield per hectare is 6.77 t. having in view that the hayfield has a surface of 33.07 hectares, the total yield of fresh fodder obtained in 2007 from Lenfin hayfield is 677.94 t and of hay 223.78 t.

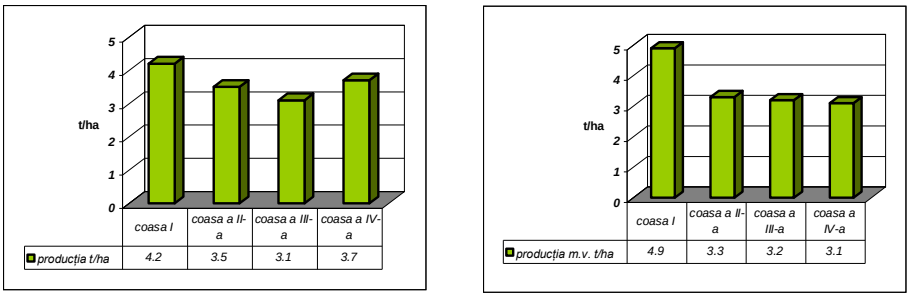



**2007** **2008**

Figure 1. The distribution of the yield on harvests for Lenfin hayfield (2007-2008)

As is shown in figure 1 for 2008, the first cut represents about a half from the total yield, the other half being distributed on the harvest 2 and 3, the results being relatively like those obtained in 2007 in Lenfin hayfield. The total yield obtained in 2008 was 20.6 t of fresh fodder per hectare. The hayfield has a surface of 33.07 hectares and the total yield obtained in 2008 from this hayfield was 681.24 t, and the hay yield was 224.88 t. the harvest for Lenfin hayfield were grouped in three harvests.

As it can be seen in figure 2 (Fürkó pasture), the yield from 2007 on those four grazing cycles is balanced, the lowest yield being determined in the third harvest. The total yield in 2007 was 14.5 t of fresh fodder per hectare. Also, there was calculated the carrying capacity per hectare, having in view that the duration use of the pasture is 150 days. Thus, the carrying capacity determined for the Fürkó pasture in 2007 was 2.23 cattle units per hectare. Having in view that the grassland has a surface of 114.45 ha, the total yield of fresh fodder obtained in 2007 from that is 1659.53 t.




**2007** **2008**

Figure 2. The distribution of the yield on harvests for Fürkó pasture (2007-2008)

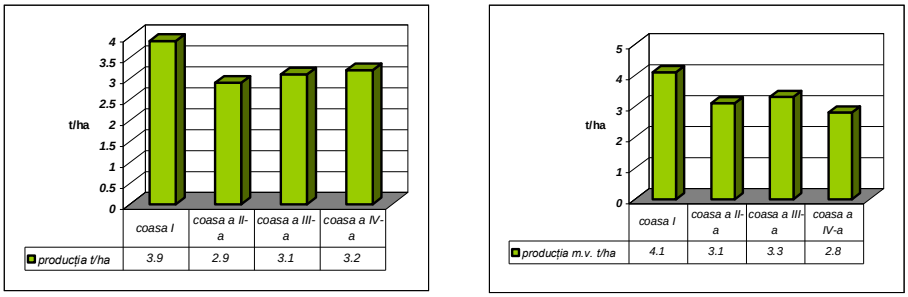
After figure 2, the yield on those four grazing cycles is balanced in 2008, the lowest yield being determined in the case of the fourth harvest. The total yield calculated on those four grazing cycles was 14.5 t/ha fresh fodder, being the same with that obtained in 2007, but the distribution on harvests is a little different from a harvest to other.

There was calculated the carrying capacity per hectare this being 2.23 cattle units per hectare as it was determined in 2007. Having in view that the grassland has a surface of 114.45 hectares, the total yield of fresh fodder obtained in 2008 is the same as the one obtained in 2007, respectively 1659.53 t.

As is shown in figure 3 the yield from Dihenes pasture on those four grazing cycles from 2007 was balanced, the lowest yield being noticed in the case of second harvest and the greatest is in the first harvest. The total yield calculated on those grazing cycles in 2007 was 13.1 t/ha fresh fodder. Also, there was calculated the carrying capacity per hectare, that being 1.75 cattle units per hectare.

In figure 3 is presented the yield from Dihenes pasture in 2008, this being relatively balanced, the lowest yield being determined in the case of the fourth harvest, and the greatest at the first harvest. The total yield calculated on those four grazing cycles in 2008 was 13.3 t/ha fresh fodder. Also, there was calculated the carrying capacity per hectare, thus being 1.77 cattle units, this value being close to the value obtained in 2007.

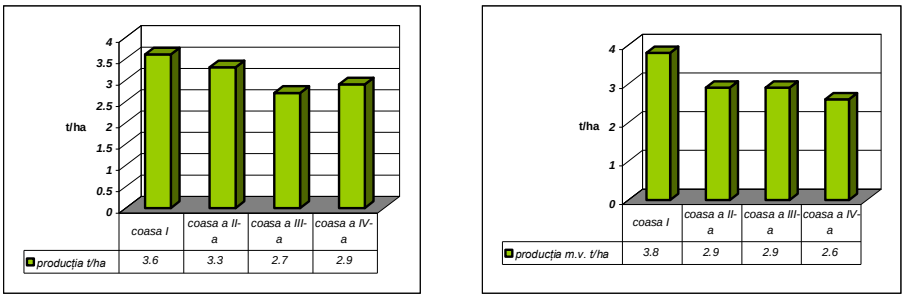
Having in view that the pasture Dihenes has a surface of 105.75 hectares the total yield obtained on that in 2008 was 1406.48 t.




**2007** **2008**

Figure 3. The distribution of the yield on harvests for Dihenes pasture (2007-2008)

In figure 4 is presented the distribution of the yield of Urkuta pasture obtained in the period 2007-2008. The yield obtained in 2007 is relatively balanced, the lowest yield being noticed in the case of the third harvest, and the greatest in the first harvest. The total yield per hectare obtained in 2007 from Urkuta pasure was 12.5 t of fresh fodder. Also, there was calculated the carrying capacity of the pasture this being 1.67 cattle units per hectare. The total surface of the pasture Urkuta is 28.36 ha and the total fresh fodder mass obtained therein 2007 is 354.5 t.




**2007** **2008**

Figure 4. The distribution of the yield on harvests for Urkuta pasture (2007-2008)

The yield obtained on those grazing cycles in 2008 on Urkuta pasture is relatively balanced, the lowest yield being noticed in the case of the fourth harvest and the greatest in the first one. The total yield obtained in 2008 during the entire year was 12.2 t/ha fresh fodder, the value obtained being close similar with that obtained in 2007. The carrying capacity calculated for 2008 was slightly lower that the one determined in 2007, this being 1.63 cattle units per hectare. The total yield obtained in 2008 from that 28.36 hectare of Urkuta pasture is 346 t.

To compare the carrying capacity of the pastures from the area of Valea lui Mihai locality they were calculated the total cattle units that are using these pastures, this being 1062.9 cattle units.

The total carrying capacity of the pastures from Valea lui Mihai was 488.63 in 2007 and 487.65 in 2008.

There can be noticed that the number of the animals that are using the grassland is greater then the carrying capacity of the pasture surfaces of the locality, and most of the necessary forage must to be provided from forage crops.

## CONCLUSIONS

After the analysis of the results obtained we can conclude the followings:

- the vegetation of the grasslands from Valea lui Mihai have a great stability during the study from the point of view if the yield and carrying capacity, the differences consisting in the distribution of the yield on harvests, this being influenced by the meteorological conditions, respectively the different distribution of the rainfall along the vegetation period;

- the number of the animals that are using grassland is greater then the carrying capacity of the pasture surfaces of the locality, thus some of the forage must to be provided from forage crops.

There is recommended the realisation of improvement works on the grasslands from Valea lui Mihai for the improvement of the yield per hectare. The recommended works are fertilisation, and the elimination of humidity excess on Urkuta pasture

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