CHANGES IN FLORISTIC COMPOSITION OF GRASSLAND IN FIBIS, TIMIŞ COUNTY UNDER THE EFFECT OF FERTILIZATION

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Abstract: *In this study the objective was to determine the changes of the floristic composition under the influence of organic, mineral and organic – mineral fertilizers on the vegetation cover of a hayfield from the hill area of western Romania, respectively Fibiş (Timiş County). In the year 2011 the average of the annual rainfall amount is 484 mm. On the season, the precipitation is rich in summer (30.7%), followed by spring (25.1%), fall (23.9%), and winter with less precipitation (20.3 Soils perdominante in Fibis area are the reddish-brown The experimental field was organized by setting 9 fertilisation variants (3 organic, 3 mineral and 3 organic – mineral fertilisation variants) and a control non-fertilised variant. The research plots were set on a homogenous vegetation sector of the hayfield. The fertilisation variants applied were the following: V1 – control;V2-20 t sheep manure,V3-40 t sheep manure,V4-60 t sheep manure,V5-20 t sheep manure+ P50 ;V6-20 t sheep manure+ P50++ K50; V7-20 t sheep manure+ N50 + P50 + K50 ;V8 - N100 + P50 + K50 ; V9 - N150 + P50 + K50 ; V10 - N100+100 + P50 + K50; The plots were set in blocks with ten variants and three replicates, each having a surface of 20 square meters (2m x 5m). The vegetation data were collected using the linear point quadrate method, thus being calculated several vegetation features. After DJUKIC et al., (2008) the manure applied on grassland determinates changes in the floristic composition involving a higher percentage of legumes in comparison with other species and grasses. The vegetation features taken in account were: the botanical composition, the biodiversity (species richness, Shannon and Simpson indexes),). The fertilisation has influenced mainly the biodiversity and the light and soil reaction ecological spectre. In a permanent grassland agro-ecosystem the floristic composition varied depending on substances flow, soil nutrients availability and climatic conditions (MOISUC et all 2001) The floristic composition studies need long time researches, as in the case of biodiversity, to provide sustainable results (DJUKIC et al., 2008)*

Keywords: *floristic composition , changes, botanical composition, biodiversity.*

INTRODUCTION.

Through correct fertilization is achieved improvement floristic composition, while irrational fertilization leads to increased weed and it reduces the proportion of useful plants. (Samfira I, A. Moisuc, 2007)

MATERIAL AND METHOD

The objective of this researches is to observe the changes of floristic composition under the effect of organic, mineral and organic-mineral fertilizers. The research plots were set on a homogenous vegetation sector of the hayfield. The fertilisation variants applied were the following: V1 – control;V2-20 t sheep manure,V3-40 t sheep manure,V4-60 t sheep manure,V5-20 t sheep manure+ P_{50} ;V6-20 t sheep manure+ P_{50+}+ K_{50}; V7-20 t sheep manure+ N_{50} + P_{50} + K_{50} ;V8 - N_{100} + P_{50} + K_{50} ; V9 - N_{150} + P_{50} + K_{50} ; V10 - $N_{100+100}$ + P_{50} + K_{50}; The plots were set in blocks with ten variants and three replicates, each having a surface of 20 square meters (2m x 5m)..

The vegetation data were collected using the linear point quadrate method (DAGET *et* POISSONET, 1971). The data obtained in this way were processed for the calculation of the biodiversity indexes Shannon and Simpson.

The Shannon index formula used in this work is the entropy one:

$$H' = -\sum_{i=1}^{S} p_i \times \ln p_i$$

where: S = species number from the studied sample (species richness); p_i = percentage of the species i din S (BEALS *et al*., 2000).

The Simpson index formula used here is: $D = \sum \left(n_i / N\right)^2 = \sum_{i=1}^{S} p_i^2$

where: n_i = the total number of individuals of the species i; N = the total number of individuals of the all species from the sample; $p_i = n_i / N$ (SAMFIRA *et al.*, 2011).

RESULTS AND DISCUSION

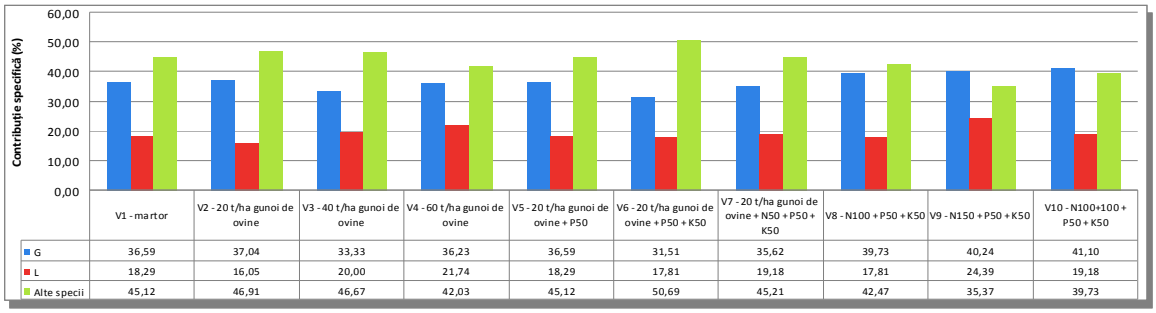
When analyzing the vegetation is noted that the control variant (V1) total number of species is 29, we see that this value increases only for organic fertilization of sheep manure 40 tons per hectare (V3) and decreases to the value of 24 to (V7), 25 (V10) and 27 (V8), (V9) and for variants (V2), (V4), (V5), (V6) is maintained at the same value with control variant.

Fertilization organic and mixed mineral does not produce changes in floristic composition where grasses. If pulses, we observe that fertilization favorably influence biodiversity, increasing the number of legume species for organic fertilization and mineral fertilization.In mixed case there is an increase in the percentage of species present only variations (V6) and (V7).

If plant species from other botanical families, it appears that fertilization regardless of its type, has a negative effect, reducing the number of species present on permanent grassland, making exception to this rule only, the variant fertilized with 40 tons organic sheep manure per ha (V3).The botanical composition of the analysed fertilisation variants is presented in *figure 1* and it shows that the chemical fertilisation has determined the increase of the grasses contribution, while the mixed fertilisation has determined the increase of the contribution of the species from other botanical families.

Dominant species of vegetation in the year 2011 was :*Agropyron repens* and *Festuca arundinaceae*, followed *by Bromus hordeaceus, Poa pratensis* and *Lotus cornicultatus*

Shannon biodiversity index (H) on the meadow in Fibiş 2011, recorded values ranging from 2.60 to 3.27 which indicates that grassland biodiversity is considered medium. Variants fertilized organically by 40 and 60 t / ha manure of sheep (V3), (V4) and the variant fertilized mixed (V6) with 20 t farmyard sheep / ha + 50 kg / ha P2O5 + 50 kg / ha K2O have an index of biodiversity higher than control (V1). Index dominance Simpson has lower values than control (V1) in the variant fertilized organically by 40 t / ha manure of sheep (V3) and fertilized variant mixed with 20 t farmyard sheep / ha + 50 kg / ha P2O5 + 50 kg / ha K2O (V6). All chemically fertilized variants V8, V9 and V10 have the same value 0.07 greater than control variant. Index Simpson D (figure 3) has values ranging from 0.05 to 0.07 indicating little species with effective population close. Value pastoral of Fibis meadows in 2011 (figure 4) has values between 36.05 and 43.01 which means a grassland with medium value. Pastoral value is higher for chemical fertilization but has higher values than control variant at the organic-mineral fertilization.



	V1 - martor	V2 - 20 t/ha gunoi de ovine	V3 - 40 t/ha gunoi de ovine	V4 - 60 t/ha gunoi de ovine	V5 - 20 t/ha gunoi de ovine + P50	V6 - 20 t/ha gunoi de ovine + P50 + K50	V7 - 20 t/ha gunoi de ovine + N50 + P50 + K50	V8 - N100 + P50 + K50	V9 - N150 + P50 + K50	V10 - N100+100 + P50 + K50
G	36,59	37,04	33,33	36,23	36,59	31,51	35,62	39,73	40,24	41,10
L	18,29	16,05	20,00	21,74	18,29	17,81	19,18	17,81	24,39	19,18
Alte specii	45,12	46,91	46,67	42,03	45,12	50,69	45,21	42,47	35,37	39,73

Fig.1. Influence of fertilisation on the floristic composition

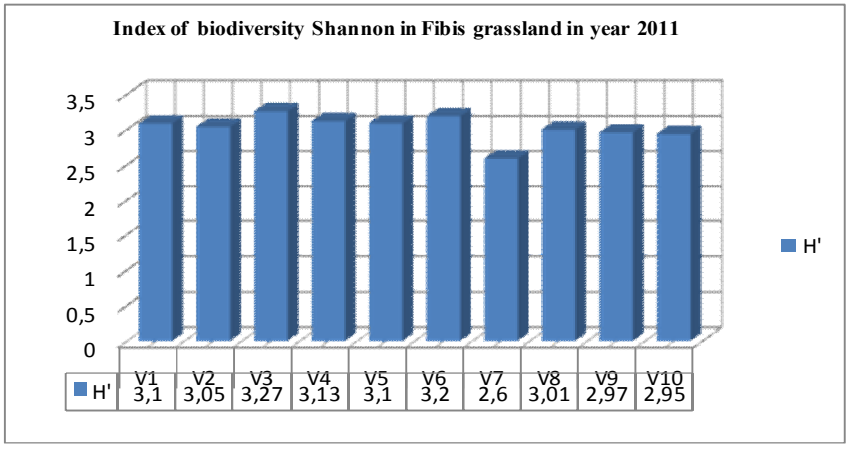


Fig.2. Influence of fertilisation on H"

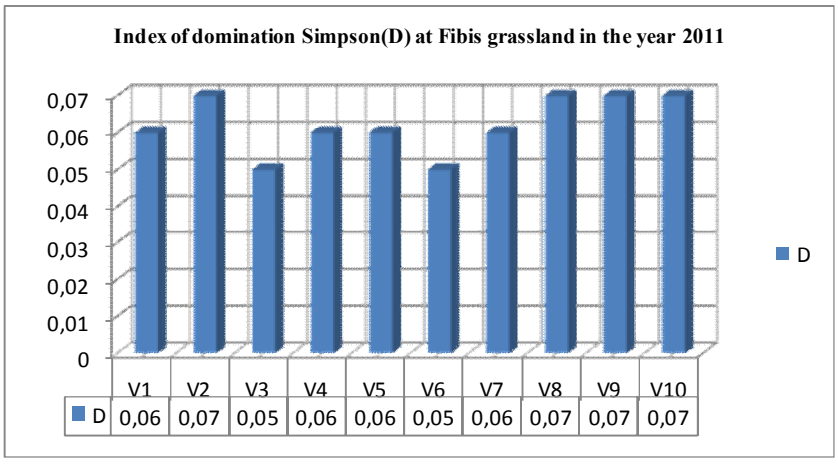


Fig.3. Influence of fertilisation on D.

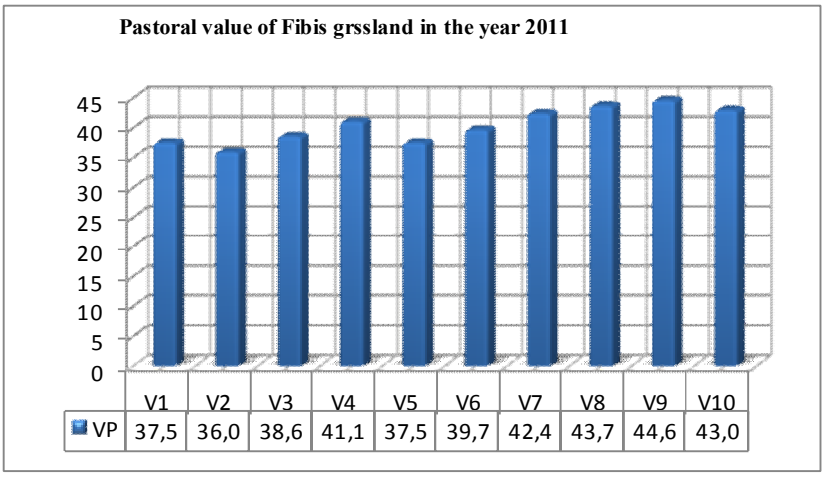


Fig.4. Influence of fertilisation on VP

CONCLUSIONS

Whether fertilization is organic, mineral or organo-mineral favoring legumes, increasing their participation in permanent grassland used as meadow of Fibiş, organic fertilization with 40 t / ha manure of sheep (V3), 60 t / ha sheep manure (V4) and at chemical fertilization with 150 kg / ha N 50 kg / ha P2O5 50 kg / ha K2O (V9) achieved a participation rate of over 20% legumes. a valuable pasture must contain 20 % -25% legumes (MOISUC and DUKIC., 2002)

The floristic composition studies need long time researches, as in the case of biodiversity, to provide sustainable results (DUKIC et al., 2008).). Application of organic fertilizers in a rational way contributes to changes in permanent pasture floristic composition, in the sense of increasing the valuable plants participation in economic terms.

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