THE INFLUENCE OF MINERAL AND ORGANIC - MINERAL FERTILISATION ON THE HAYFIELD PRODUCTION FROM BANAT (ROMANIA) HILL REGION

M. COMAN, Al. MOISUC

Banat's University of Agricultural Sciences and Veterinary Medicine from Timisoara
Calea Aradului, no. 119, RO 300645
E-mail: comanmario81@yahoo.com

Abstract: *In this study the objective was to determine the effects of mineral and organic – mineral fertilizers on the production of a hayfield from the hill area of western Romania, respectively Fibiş (Timiş County). The average of the annual air temperature in this region is 10.7 ^oC and the average of the annual rainfall amount is 608 mm. The climate in the studied area is temperate continental with Mediterranean influences. The experimental field was organized by setting 9 fertilisation variants (3 mineral,3 organic and 3 organic – mineral fertilisation variants) and a control non-fertilised variant.One of the most important maintenance works needed in grasslands is represented by fertilization. Every type of grasslands has different fertilisation needs, so the importance of this research is to set the optimal fertilization rate with for different types of fertilizing(mineral, organic and mixed). Every fertilisation experience is organized in ten variants and three replicates. The permanent grasslands is visibly influenced by fertilisation starting with the first year from the fertiliser application. The methodology used focuses on the principle of restitution of nutrients exported with the harvest, and based Bossingaul principle formulated by Justus von Liebig in XIX century and refers to the fact that culture plants consuming nutrients in the soil for crop depletes soil formation in those elements that are removed from the surface with crop, resulting in time reduce soil fertility. It appeared, therefore the necessity to return soil nutrients. The numerous researches show that applying fertilisers on grasslands is justified economically since, on the average, 1 kg of active element results in an increase of 80-100 kg of green matter. This economic productivity is also strengthened by the fact that from 1 ton of dried matter we can extract 20-21 kg of N, 6-8 kg of P_2O_5, 20-21kg of K_2O and 10-14 kg of CaO. As a conclusion, we can say that fertilising grasslands results, on the average, in a twofold to threefold increase of the yield.*

Key words: *mineral, fertilisation, organic ferilisation, production, sheep manure*

INTRODUCTION

The aim of this research is to evidence several aspects of the fertilisation influence on the forest steppe grassland production. Loss of biodiversity is a pressing problem for the biosphere. Organic fertilization and rational use of fertilizers can produce substantial increases in the production and biodiversity, and in food quality improvement (VANTU et all., 2008). After DJUKIC et all., (2008) the manure applied on grassland determinates changes in the floristic composition involving a higher percentage of legumes in comparison with other species and grases. Animal manure remanence duration is 4-5 years depending on the rate applied, on the fertiliser quality, and on the grassland floristic composition. The highest increases in yield are in the 1st year, but it decreases steadily from one year to another (SAMFIRA et MOISUC, 2007).

MATERIAL AND METHODS

The objective of this study is to compare different mineral and organic-mineral

fertilisation doses applied on forest steppe grassland vegetation from the hill area of western Romania, respectively Fibiş (Timiş County).The research plots were set on a homogenous vegetation sector of the hayfield. The fertilisation variants applied were the following: Control;V1-20 t sheep manure;V2-40 t sheep manure;V3-60 t sheep manure;V4-20 t sheep manure+ P_{50};V5-20 t sheep manure+ P_{50+}+ K_{50}; V6-20 t sheep manure+ N_{50} + P_{50} + K_{50} ;V7 - N_{100} + P_{50} + K_{50} ; V8 - N_{150} + P_{50} + K_{50} ; V9 - $N_{100+100}$ + P_{50} + K_{50}; The plots were set in blocks with seven variants and three replicates, each having a surface of 20 square meters (4m x 5m). They have been harvested by cutting twice a year. The fertilisers were applied in November 2010 and the data were collected in 2011.

RESULTS AND DISCUSSIONS

Fertilization is one of the main measures to increase production, fertilizers on lawns role as a multiple and complex. Plant harvesting, of pastures, several times during the period of vegetation results in extracting and removing nutrients from the soil with each harvest. The aim of our research was to determine the optimal dose of organic fertilizer, mineral or mixed leading to an increase of high production and economically efficient.

Table 1

Production, the first mowing after application of different doses of organic and mineral fertilizers

Varianta	Productia (kg)	Diferenta	%
Martor	10.90	-	-
V1	13.70	2.80	125.69
V2	13.10	2.20	120.18
V3	14.23	3.33	130.58
V4	14.47	3.57	132.72
V5	14.23	3.33	130.58
V6	16.63	5.73	152.60
V7	16.40	5.50	150.46
V8	16.80	5.90	154.13
V9	15.80	4.90	144.95

The results of different doses of organic fertilizers, minerals and mixed meadows of Fibis (western Romania, Timis county) and their effect on the production of green table the first mowing is given in Table 1, respectively Figure 1. As shown in Table 1, the average production in kg Witness (unfertilized variant) is 10.90. Application of different doses of fertilizer in fertilized variants lead to an increase in production, is relevant to the field data obtained and presented in the paper. Thus, option 1 is treated with a fertilizer dose of 20 t of sheep manure cause an increase in production by 2.80 kg compared to untreated control. Application on lawn, go to a higher dose, namely sheep manure 40 t, and this leads to a higher yield compared with unfertilized witness, but as shown in Figure 1, production is slightly less than V1. With the application of mixed fertilizers (manure of sheep and fertilizers) and there is increased production both to witness and to variants which applied only to manure, with one exception but when V3 (60 t farmyard sheep) recorded the same production with V5 (20 t of sheep manure + P50 + + K50). Our research results showed that application of mineral fertilizers only increases the production of green table against the options apply only organic fertilizers. If such greasy lawn with 20 t of sheep manure (V1) provides a higher green mass 2.80 kg compared with control, application of fertilizers doses of N100 + P50 + K50 (V7)

ensures a higher green mass 5.50 kg compared with control and a difference of 2.70 kg compared to V1.

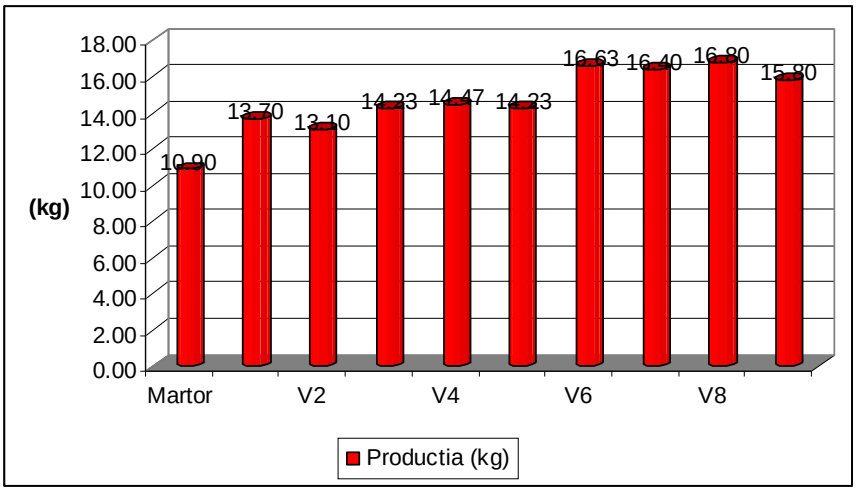

Figure 1. Graphical representation of average production scythe no. 1, after application of different doses of organic and mineral fertilizers

Table 2

Production, no sewing. 2, after application of different doses of organic and mineral fertilizers

Variant	Production (kg)	Differance	%
Martor	3.89	-	-
V1	4.47	0.58	114.96
V2	4.45	0.57	114.62
V3	5.47	1.59	140.84
V4	4.53	0.64	116.47
V5	4.67	0.79	120.32
V6	5.77	1.88	148.39
V7	5.73	1.85	147.56
V8	5.99	2.11	154.22
V9	*5.17*	*1.29*	*133.08*

The results of different doses of organic fertilizers, minerals and mixed meadows of Fibis (western Romania, Timis county) and their effect on the production of green table the first mowing is given in Table 1, respectively Figure 1. As shown in Table, the average production in kg Witness (unfertilized variant) is 3.89. Application of different doses of fertilizer in fertilized variants lead to an increase in production, is relevant to the field data obtained and presented in the paper. Thus, option 1 is treated with a fertilizer dose of 20 t of sheep manure cause an increase in production by 0.58 kg compared to untreated control. Application on lawn, go to a higher dose, namely sheep manure 40 t, and this leads to a higher yield compared with unfertilized witness, but as shown in Figure 2, production is slightly less than V1. With the application of mixed fertilizers (manure of sheep and fertilizers) and there is increased production both to witness and to variants which applied only to manure, with one exception but when V3 (60 t farmyard sheep) recorded the same production with V5 (20 t of sheep manure + P50 + + K50). Our research results showed that application of mineral fertilizers only increases the production of green table

against the options apply only organic fertilizers. If such greasy lawn with 20 t of sheep manure (V1) provides a higher green mass 2.80 kg compared with control, application of fertilizers doses of N150 + P50 + K50 (V8) ensures a higher green mass 2.1 kg compared with control and a difference of 1.52 kg compared to V1..

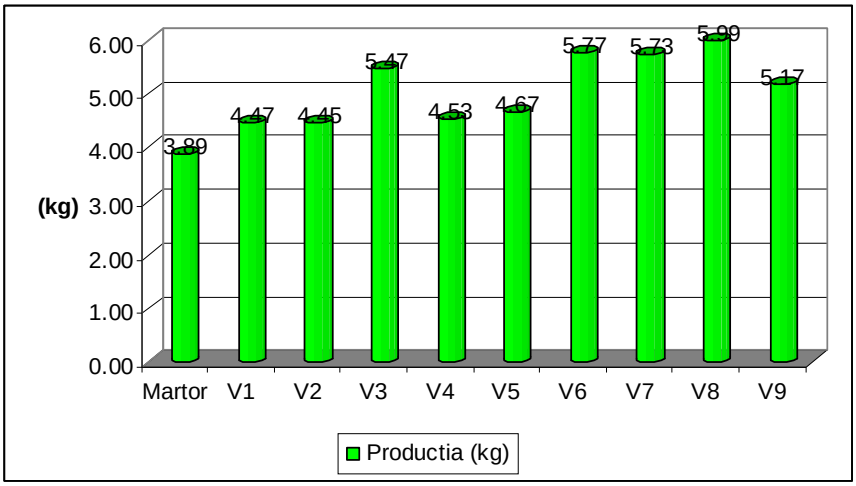

Figure 2. Graphical representation of average production scythe no. 2, after application of different doses of organic and mineral fertilizers

CONCLUSIONS

Fertilization increases the twinning energy, growth and recovery after grazing or mowing grass and change the floristic composition, being grasses favored development of high economic value, while making lower species disappear and a lot of weeds.

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