The Influence of Harvest Period and Fertilisation on the Yield of Some Mixed Grass and Leguminous Species Under the Forest Steppe Conditions of North-East Romania

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Introduction In the forest steppe area of North-east Romania, temporary grasslands represent an important source of high quality fodder but they have a short period of exploitation, associated with some changes in the floristic composition (Vintu, 2003). Fertiliser application and harvest period have an important role in maintaining high productivity (Hopkins, 1991). The aim of this paper is to determine the influence of harvest period and fertilization on the yield of some grass and leguminous species in the forest steppe conditions of North-east Romania.

Material and methods The experiment was a randomised block design with the following factors: factor A – harvest period: a_1 – repeated mowing; a_2 – hay cut; factor B**:** mixture of grasses and perennial leguminous species: b_1 –*Dactylis glomerata* 20% + *Lolium perenne,* 30% + *Medicago sativa* 50%; b_2 –*Festuca pratensi,s* 25% + *Lolium perenne*, 25% + *Agropyron pectiniforme,* 10% + *Lotus corniculatus,* 10% + *Medicago sativa,* 30%; factor C: fertiliser: c_1 – unfertilized; c_2 – manure 20 t/ha annually; c_3 – N_{100} fertiliser annually; c_4 – manure 20t/ha + N_{50} fertiliser annually.

Results The average yield of dry matter (DM) varied between 4.50–7.45 t/ha for repeated mowing and between 5.23 – 7.77 t/ha for the hay cut (Table 1). The DM yield was higher for the b_2 mixture.. The highest yield was obtained from the fertilised treatment with manure at 20 t/ha + N_{50} used annually, regardless of the harvest period or the type of mixture of perennial grasses. After 4 years of treatments, species other than grasses and legumes have increased to 4–10%, while the cover of grasses and legumes has declined (Table 2).

Table 1 Yield of dry matter (t/ha)

Factor A	Factor B	Factor C	Yield	%	Significance
a1	b1	c1	4.50	100	
		c2	5.64	125	*
		c3	5.92	131	**
		c4	7.50	166	***
	b2	c1	5.36	119	*
		c2	6.43	143	***
		c3	6.31	140	***
		c4	7.45	165	***
a2	b1	c1	5.23	116	
		c2	7.22	160	***
		c3	6.80	151	***
		c4	7.56	168	***
	b2	c1	6.09	135	**
		c2	7.48	166	***
		c3	7.26	161	***
		c4	7.77	173	***

*, *P*<0.05; **, *P<0.01;* ***, P<0.001

Table 2 Vegetation cover (%)

Factor A	Factor B	Factor C	G	L	OS
a1	b1	c1	60	36	4
		c2	53	40	7
		c3	57	38	5
		c4	52	40	8
	b2	c1	53	31	6
		c2	58	35	7
		c3	65	30	5
		c4	61	32	7
a2	b1	c1	51	44	5
		c2	44	48	8
		c3	53	40	7
		c4	51	42	7
	b2	c1	59	34	7
		c2	55	35	10
		c3	58	33	9
		c4	54	36	10

G - grasses; L – legumes; OS – other species

Conclusions Temporary grasslands from the North–east forest steppe of Romania reach the highest productivity level used as hayfields, regardless of the type of mixture or the fertiliser application rate. After four years of use, the floristic composition shows important changes from the original sward; grasses, legumes and other species represented 44-65%, 30-48% and 4-10% respectively..

References

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