

THE APPLICABILITY OF GRASS ALFALFA MIXTURE FOR BIOMASS PRODUCTION AND LANDSCAPE SUSTAINABILITY.

Jozef VOLOŠIN, František MAJERNIK

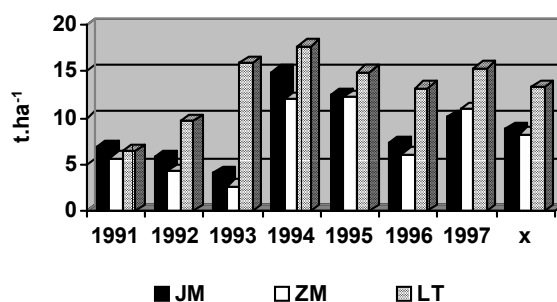
Grassland and Mountain Agriculture Research Institute, Mladeznicka 36, 974 21 Banska Bystrica, Slovakia

Summary

From many different registered legumes and grasses in Slovakia is possible to make grass clover mixture created for specific ecological condition and purposes without expectation of dramatic changes of grass clover pasture yield. The most productive are grass alfalfa mixture – 12,28 t.ha⁻¹ followed by simple grass clover mixture – 8,80 t.ha⁻¹ and composite grass clover mixture – 7,73 t.ha⁻¹ (Figure 1).

Keywords: temporary grass clover mixture, biological, ecological, biomass, ad libidum feeding, simple and two -constituents mixture, fertilisation, production, landscape designing

Fig. 1 The dry matter production for the year 1991 - 1997



Legend: JM = simple mixture
ZM = composite mixture
LT = grass alfalfa mixture

Introduction

In the frame of sustainable tendency of agriculture, share of fodder crops should be higher in the crop sequences. We have many good results from the past and present time, pointing to importance of grass clover mixture as a fodder resources contributed to sustainability of landscape. Each species have advantages and disadvantages for different situation. The growing simple grass clover mixture show up more suitable for Slovak condition. (Krajčovič et al,1968). Is better to used sowing mixture with different vegetation cycle for cutting, grazing, for ley, silage or seed production(Caputa et al,1970). The grass clover mixture are the most typical fodder plants of over the world (Krajčovič et al.,1995).

Material and methods

The field trial was establish on arable land in Nitra river valley ,145 m about sea level, with local position 48°14' and 18°05', average year temperature 9,7°C and 16,6 °C during vegetation period, 580mm or 323 mm year and vegetation precipitation, respectively. The soil is gley fluvisol. The aim of this study was to ascertained production capability, quality, persistence and ecological function of simple and composite grass clover mixture of some grasses, interspecific hybrids and following clover species – *Trifolium pratense* L. (variety SIGORD), *Medicago sativa* L.(PALAVA), *Lotus corniculatus* L.(POLOM), *Trifolium repens* L. (HUIA) and *Onobrychis viciifolia* SCOP.(VIGLAŠSKÝ). The crops were establish without cover crops, in dry land with three cuttings in 1991 –1997.

Results and discussion

Temporary grass clover mixture have been evaluated during 1971 – 1997. The biological and ecological relationship of grass and clover component and botanical composition of grass clover mixture and grass clover pasture yield have been studied. From this reason we included besides composite mixture (treatments 5-13) with 5-13 components (Table 2.) also simple two-components mixture. In the composite mixture the influence of the most competitive components, cockfoot (*Dactylis glomerata* L., *Arrhenatherum elatius*, L. , interspecific hybrid FELINA, *Lolium perenne* L.), have been revealed. Total dry matter yield of grass clover mixture depends from sufficient amount of fertiliser, predominantly in composite mixture was significant decline of yield during time without nitrogen application (5,75 - 4,30- 2,70 tonne per ha).

At the present time dose of 120 kg of nitrogen is evaluated. In the seventieth higher dose of fertiliser(240 – 300 kg ha⁻¹) were used in trials due to favourable price Krajčovič et al.1968, Caputa et al,1970). The most productive are mixture with alfalfa(13,28 t/ha dry matter). The less yielding treatments from 22 evaluated simple or composite mixture were treatments No. 7, 10 and 12. The *Lotus corniculatus* L. had a good share in composition of grass clover mixture No15 during hole experiment with 15 – 20% share. Maintain of clover part in sword after third year after seeding in treatments with 120kg ha nitrogen supported total dry matter yield in mixture of red clover *Trifolium pratense*, L. and *Festuca arundinacea* L. - 9,51 tonne dry matter per ha per year, red clover with interspecific hybrid FELINA (9,36 t ha⁻¹ dry matter).The large research of simple and two components mixture(Krajčovič et. al,1995) documented, that varieties with low yield by single cropping are also less competitive with red clover mixture. The *Lotus corniculatus* L.as a complementary species in grass clover mixture can be used in all growing region of Slovakia due to adaptability and persistence and is recommended into temporary and perennial grass clover mixture, for undersowing, from arable land to grass pasture conversion, for interrows in orchards, vineyards and small fruits. There are aspects of landscape sustainability. Due to raising importance of *Lotus corniculatus* L. we solve also seed management production

References

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Table 1: The timing and fertilisation level

Years	Fertilisation kg.ha ⁻¹			Spring application	N – application after first cutting
	N	P	K		
1991	6	35,2	83,0	60	-
1992	-	35,2	83,0	-	-
1993	-	35,2	83,0	-	-
1994	120	35,2	83,0	60	60
1995	120	35,2	83,0	60	60
1996	60	35,2	83,0	30	30
1997	120	35,2	83,0	60	60

Table 2 Solid production for the years of monitoring (years 1991 - 1997 in t.ha⁻¹).

Variant	1991	1992	1993	1994	1995	1996	1996	\bar{x}	Poradie
1	7,25	6,39	3,49	12,83	12,16	5,70	10,95	8,40	12
2	8,94	6,81	2,89	11,39	10,49	4,86	10,91	8,04	15
3	8,15	4,60	6,37	14,80	12,62	9,49	10,46	9,50	5
4	7,29	3,52	5,40	15,72	11,86	11,06	10,37	9,32	7
5	7,97	5,67	3,60	17,39	11,91	6,13	11,78	9,21	8
6	6,13	4,11	3,01	11,68	12,12	5,27	10,79	7,59	18
7	6,63	4,52	2,41	9,53	12,10	5,17	10,70	7,29	20
8	6,60	5,64	3,82	12,56	13,55	6,86	10,83	8,55	10
9	4,88	4,70	3,01	10,58	12,47	4,95	11,56	7,45	19
10	5,81	3,32	2,01	11,32	11,03	6,15	11,18	7,26	21
11	5,15	3,95	3,24	13,36	13,07	7,72	10,72	8,17	14
12	4,40	2,82	1,15	9,12	11,54	6,34	10,25	6,52	22
13	4,22	3,98	2,10	12,52	12,30	6,75	11,32	7,60	17
14	5,27	4,38	2,17	16,19	12,01	6,90	8,57	7,93	16
15	5,11	3,87	8,80	15,34	13,10	7,78	10,12	9,16	9
16	5,74	5,12	2,96	18,49	12,96	6,62	7,81	8,53	11
17	7,89	11,43	1,95	14,66	12,09	7,08	11,44	9,51	4
18	6,92	6,15	2,90	15,60	15,04	6,50	12,42	9,36	6
19	6,40	6,24	3,82	14,39	12,19	6,70	8,23	8,28	13
20	6,74	9,37	14,88	17,13	15,33	12,77	15,58	13,11	3
21	5,51	10,49	15,80	17,81	14,17	13,36	16,18	13,33	2
22	6,97	9,01	16,88	18,10	15,17	13,50	14,20	13,40	1
Spolu	139,97	126,09	112,66	310,51	279,28	167,66	246,37	197,40	-
\bar{x}	6,36	5,73	5,12	14,11	12,69	7,62	11,20	8,97	-
Poradie	5	6	7	1	2	4	3	-	-