

## THE INFLUENCE OF THE PROPORTION BETWEEN THE COMPONENTS IN TWO SIMPLE SHORT-EXPLOITATION MIXTURES

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### ABSTRACT

As average, for an experimental period of two years (2012-2013) the two short exploitation mixtures that represented the graduations of factor A (mixture) had the same productive capacity.

The proportion between the grasses and legumes has influenced, in the same way, both the production of the *Lolium perenne* + *Trifolium pratense* pasture and the *Festuca pratensis* + *Trifolium pratense* pasture. Thus for the mixture that used *Lolium perenne*, the production increased to 4.88 t ha<sup>-1</sup>d.m. (ratio 75/25%) up to 6.46 t ha<sup>-1</sup>d.m. (ratio 25/75%). The increases were proved to be important and very important. For the mixture of *Festuca pratensis* + *Trifolium pratense* the productions were 5.26 t ha<sup>-1</sup>d.m. in the proportion of 75/25%, 5.56 t ha<sup>-1</sup>d.m. to 50/50% and 6.16 t ha<sup>-1</sup>d.m. at 25/75 ratio %.

### INTRODUCTION

In the case of short term pastures, which must provide high production in the first year of vegetation and last only for 2-3 years, we choose rapidly developing species and short vivacity. These form the flowering even in the first year of vegetation, giving maximum yields in the second year and live 1 (2) - 3 (4) years.

Once the species are chosen, it comes to establishing a certain relation between grasses and legumes. It can vary within fairly wide limits, from 20% to 80% for each of the two groups of plants of the mixture.

For a long life span, or, if the grassland will be used by grazing we shall establish a higher proportion of grasses given the high vivacity of these species and the good resistance to grazing. On the contrary, for a short term use and use as hay, when we want to achieve a feed rich in protein, vitamins and minerals, the report may be balanced or even favorable to legumes.

It should be noted that the ratio of grasses and legumes achieved in the seed mixture, is rarely found in the floristic structure of the temporary grassland.

Furthermore from year to year there are fluctuations in the proportion of grasses and legumes participation (**Ionescu I., 2001, 2003**).

Among the causes that determine this floristic trend we can mention: higher competitive ability of grasses, lower claims regarding the environment, great opportunities for adaptation on acid soils, strong reaction to nitrogen for this group of species (**Ionescu I., 2003**).

### MATERIAL AND METHOD

Experience was located at the Preajba Experimental Center for the culture of grasslands, Gorj county, in 2012, early spring in March.

The location system was divided into plots with 2 factors, as follows:

Factor A – the mixture, with 2 graduations:

$a_1 = 50\% \text{ Lolium perenne} + 50\% \text{ Trifolium pratense};$

$a_2 = 50\% \text{ Festuca pratensis} + 50\% \text{ Trifolium pratense}.$

Factor B – the proportion between the grasses and legumes:

$b_1 = 75\% \text{ grasses} + 25\% \text{ legumes};$

$b_2 = 50\% \text{ grasses} + 50\% \text{ legumes};$

$b_3 = 25\% \text{ grasses} + 75\% \text{ legumes}.$

The experience was fertilized uniformly with 100 kg / ha N, 50 kg / ha P<sub>2</sub>O<sub>5</sub>, 50 kg / ha K<sub>2</sub>O and harvested as grassland. For planting, the following varieties were used:

- for *Lolium perenne*, the Calibra variety;
- for *Festuca pratensis*, the Laura variety;
- for *Trifolium pratense*, the Nike variety.

## RESULTS AND DISCUSSIONS

### Dry matter production averaged over 2 years (2012-2013)

As an average, for an experimental period of two years (2012-2013) the two short operating mixtures that represented the graduations of factor A (the mixture) had the same productive capacity (Table 1).

#### Separate the influence of the mixture on the production of short- exploitation temporary meadows from Preajba – Gorj (average 2012- 2013, t ha<sup>-1</sup>d.m.)

No	Mixture	Yield (t ha <sup>-1</sup> d.m. )	%	Difference	Significance
1	<i>Lolium perenne</i> + <i>Trifolium pratense</i>	5,70	100	-	Control
2	<i>Festuca pratensis</i> + <i>Trifolium pratense</i>	5,66	99	- 0, 04	-

DL 5 % = 0,39 t ha<sup>-1</sup>d.m.; L 1 % = 0,64 t ha<sup>-1</sup>d.m.; DL 0,1 % = 1,20 t ha<sup>-1</sup>d.m.

Both the *Lolium perenne* + *Trifolium pratense* pasture and the one that consists of *Festuca pratensis* + *Trifolium pratense* gave almost equal production, i.e. 5.70 t ha<sup>-1</sup>d.m. and 5.66 t ha<sup>-1</sup>d.m. The difference between the amounts, of 0.04 t, is negligible, insignificant.

The above data is a confirmation of the conclusion that for a given area there are several formulas for mixtures with very similar productive capacity, provided that it contains species adapted to the area.

The proportion of the components of mixtures, and between species of grasses and red clover resulted in significant variations of the harvested production of the 2 short term grassland (Table 2).

Table 2

#### Separate the influence of proportion of grasses and red clover on the production of short- exploitation temporary meadows from Preajba – Gorj (average 2012- 2013, t ha<sup>-1</sup>d.m.)

No	Proportion grass/red clover	Yield (t ha <sup>-1</sup> d.m. )	%	Difference	Significance
1	75/25 %	5,07	100	-	Control
2	50/50 %	5,65	111	0,58	**
3	25/75 %	6,31	124	1,24	***

DL 5 % = 0,39 t ha<sup>-1</sup>d.m.; DL 1 % = 0,53 t ha<sup>-1</sup>d.m. ;DL 0,1 % = 0,73 t ha<sup>-1</sup>d.m.

As a witness variant we considered the report 75% grass 25% legumes, achieving an average over both graduations of the "blend" factor a production of 5.07 t ha<sup>-1</sup>d.m.

When the two components are involved in equal proportion (50/50%) the production increased by 11 percentage points or, in absolute figures 0.58 t ha<sup>-1</sup>d.m. (significant distinct increase) to the level of 5.65 t ha<sup>-1</sup>d.m.

The decrease in the proportion of grasses to 25%, while increasing the participation of legumes to 75%, led to a further increase in the amount of harvested forage, ie, to 6.31 t ha<sup>-1</sup>d.m. which is a very significant increase in the statistical report.

The presented data suggestively show the important contribution of legumes to the quantitative increase in the s.u. production. The more increased the percentage of legumes in the mixture of seeds for sowing, the more increased the production, the determined gains having a high degree of insurance.

As demonstrated by the data presented in Table 3, the proportion between the grasses and legumes has influenced, in the same way, both the production of *Lolium perenne* + *Trifolium pratense* grassland and the *Festuca pratensis* + *Trifolium pratense* pasture.

Table 3

**The combined influence of the proportion of the components with the mixture on the production of short- exploitation temporary meadows from Preajba – Gorj (average 2012- 2013, t ha<sup>-1</sup>d.m.)**

No	Proportion grass/red clover	Mixture	Yield (t ha <sup>-1</sup> d.m.)	%	Difference	Significance
1	75/25 %	<i>Lolium perenne</i> + <i>Trifolium pratense</i>	4,88	100	-	Control
2	50/50 %		5,75	118	0,87	**
3	25/75 %		6,46	132	1,58	***
4	75/25 %	<i>Festuca pratensis</i> + <i>Trifolium pratense</i>	5,26	100	-	Control
5	50/50 %		5,56	106	0,30	-
6	25/75 %		6,16	117	0,90	**

DL 5 % = 0,55 t ha<sup>-1</sup>d.m.; DL 1 % = 0,75 t ha<sup>-1</sup>d.m.; DL 0,1 % = 1,04 t ha<sup>-1</sup>d.m.

Thus, for the mixture that used *Lolium perenne*, the production increased from 4.88 t ha<sup>-1</sup> (ratio 75/25%) up to 6.46 t ha<sup>-1</sup> (ratio 25/75%). The increases were proved to be distinctly important and very important.

For the mixture of *Festuca pratensis* + *Trifolium pratense* pasture the productions was of 5.26 t ha<sup>-1</sup>d.m. in the proportion of 75/25%, of 5.56 t ha<sup>-1</sup>d.m. to 50/50% and 6.16 t ha<sup>-1</sup>d.m. at 25/75% ratio. Only the growth achieved in the case of the last report turned out to be significant.

Analysis of the influence of the mixture with the proportion clearly shows small differences between the two experimental grasslands, not only in general, as revealed in Table 7.9. but also in the same proportions of the components (Table 4).

The differences, positive or negative between the mixture of *Lolium perenne* + *Trifolium pratense* and the mixture of *Festuca pratensis* + *Trifolium pratense* were far below the limits of statistic insurance.

But there are insured differences between mixtures, if comparisons are made at different ratios between the two components. So for example, the mixture of 25% *Festuca pratensis* + 75% *Trifolium pratense* achieved a production of 6.16 t ha<sup>-1</sup>d.m., with 1.28 t ha<sup>-1</sup>d.m. more (significant distinct increase) as contrary to the mixture with 75% *Lolium perenne* + 25% *Trifolium pratense* (4.88 t ha<sup>-1</sup>d.m.).

Even if the maximum quantity has been achieved in 25% grasses and 75% legumes, we consider that the equal percentage of the parts (50/50%) is higher leading to a feed more balanced between energy and protein components.

Table 4

**The combined influence of the mixture with the proportion of components on the production of short-exploitation temporary meadows from Preajba – Gorj (average 2012- 2013, t ha<sup>-1</sup>d.m.)**

No	Mixture	Proportion grass/red clover	Yield (t ha <sup>-1</sup> d.m.)	%	Difference	Significance
1	<i>Lolium perenne</i> + <i>Trifolium pratense</i>	75/25 %	4,88	100	-	Control
2	<i>Festuca pratensis</i> + <i>Trifolium pratense</i>		5,26	108	0,38	-
3	<i>Lolium perenne</i> + <i>Trifolium pratense</i>	50/50 %	5,75	100	-	Control
4	<i>Festuca pratensis</i> + <i>Trifolium pratense</i>		5,56	97	- 0,19	-
5	<i>Lolium perenne</i> + <i>Trifolium pratense</i>	25/75 %	6,46	100	-	Control
6	<i>Festuca pratensis</i> + <i>Trifolium pratense</i>		6,16	95	- 0,30	-

DL 5 % = 0,59 t ha<sup>-1</sup> d.m.; DL 1 % = 0,87 t ha<sup>-1</sup> d.m.; DL 0,1 % = 1,37 t ha<sup>-1</sup> d.m.

### CONCLUSIONS

1. As an average, for an experimental period of two years (2012-2013) the two short exploitation mixtures that represented the graduations of factor A (the mixture) had the same productive capacity. Both the *Lolium perenne* + *Trifolium pratense* pasture and the one that consists of *Festuca pratensis* + *Trifolium pratense* gave almost equal production, i.e. 5.70 t ha<sup>-1</sup>d.m. and 5.66 t ha<sup>-1</sup>d.m. The difference between the amounts, of 0.04 t, is negligible, insignificant.

2. The proportion between the grasses and legumes has influenced, in the same way, both the production of *Lolium perenne* + *Trifolium pratense* grassland and the *Festuca pratensis* + *Trifolium pratense* pasture.

3. For the mixture that used *Lolium perenne*, the production increased from 4.88 t ha<sup>-1</sup> (ratio 75/25%) up to 6.46 t ha<sup>-1</sup> (ratio 25/75%). The increases were proved to be distinctly important and very important.

4. For the mixture of *Festuca pratensis* + *Trifolium pratense* pasture the productions was of 5.26 t ha<sup>-1</sup>d.m. in the proportion of 75/25%, of 5.56 t ha<sup>-1</sup>d.m. to 50/50% and 6.16 t ha<sup>-1</sup>d.m. at 25/75% ratio. Only the growth achieved in the case of the last report turned out to be significant.

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