THE IMPROVEMENT OF THE PASTURELANDS PLACED ON SALTY SOILS FROM N-E PART OF BRĂILA COUNTY THROUGH AMENDMENTS, FERTILIZATION AND IRRIGATION WORKS

ÎMBUNĂTĂŢIREA PAJIŞTILOR DE PE SĂRĂTURI DIN N-E JUDEŢULUI BRĂILA PRIN AMENDARE, FERTILIZARE ŞI IRIGARE

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Abstract. *The salt loving pasturelands from the N-E part of Brăila County can be improved by amendments with calcium sulphate, fertilized with organic and mineral fertilizers and irrigated, in order to increase the productive potential, to improve the floristic composition and the quality of the obtained fodder. For a pastureland of Puccinellia distans ssp. limosa, the amendments with calcium sulphate 3 t/ha and 6 t/ha, the fertilization with manure 10 – 20 t/ha and complex fertilizers (22-22-0) 100 – 200 t/ha and irrigation with 400 m^3 water/ha, the production increased from 0.90 t d.m./ha for the control variant to 3.33 – 3.4 t d.m./ha. As an effect of the improvement works, the fodder's content in raw protein increased from 6.26% to 8.75 – 8.85%.*

Key words: salt loving pasturelands, improvement works, *Puccinellia distans ssp. limosa,* fodder's quality

Rezumat. *Pajiştile halofile din N-E judeţului Brăila pot fi ameliorate prin amendare cu gips, fertilizate cu îngrăşăminte organice şi minerale şi irigate, cu scopul sporirii potenţialului productiv, al îmbunătăţirii compoziţiei floristice şi a calităţii furajului obţinut. La o pajişte de Puccinellia distans ssp. limosa, prin amendare cu gips 3 t/ha şi 6 t/ha, fertilizare cu gunoi de grajd 10 – 20 t/ha, îngrăşăminte complexe (22-22-0) 100 – 200 t/ha şi irigare cu 400 m^3 apă/ha, s-a ajuns ca producţia să crească de la 0,90 t s.u./ha la martor la 3,33 – 3,4 t s.u./ha. Ca efect al lucrărilor ameliorative, conţinutul furajului în proteină brută a crescut de la 6,26% la 8,75 – 8,85%.*

Cuvinte cheie: pajişti halofile, lucrări ameliorative, *Puccinellia distans ssp. limosa,* calitate furaj

INTRODUCTION

Grasslands placed on salty soils are wide spread in Romanian Plain, Oltenia's Plain, Western Plain, Moldavia's Plain, Prut's and Bârlad Water Meadows and on small surfaces in other geographical areas (T. Iacob and cowork., 1996). Most of these grasslands have low fodder value, because of the improper floristic composition, give small productions and are used for a short period for pasturing. The improvement of these salt loving grasslands can be realized through amendments, fertilization and irrigation, in order to increase production and to improve the floristic composition and the fodder's quality (V. Surăianu, 1993).

The *Puccinellia distans* grasslands are the most representative salt loving grasslands and can be improved through amendments with calcium sulphate, organic and mineral fertilizers applications and irrigation (Cozma Cătălina, 2009).

MATERIAL AND METHOD

To improve a grassland of *Puccinellia distans ssp. limosa*, we settled an experimental area in the northeastern part of Brăila County, during 2006 – 2008, with the following factors:

Factor A – irrigation a_1 – non irrigated; a_2 – irrigated with 400 m^3 water/ha, in two sessions;

Factor B – amendments b_1 – untreated control; b_2 – amended with 3 t calcium sulphate/ha; b_3 – amended with 6 t calcium sulphate/ha;

Factor C – fertilization c_1 – unfertilized control; c_2 – 10 t cattle manure/ha annually; c_3 – 20 t cattle manure/ha annually; c_4 – complex fertilizer (22-22-0) 100 kg/ha; c_5 – complex fertilizer (22-22-0) 200 kg/ha; c_6 - 10 t cattle manure/ha + complex fertilizer (22-22-0) 100 kg/ha; c_7 - 10 t cattle manure/ha + complex fertilizer (22-22-0) 200 kg/ha; c_8 - 20 t cattle manure/ha+ complex fertilizer (22-22-0) 100 kg/ha; c_9 - 20 t cattle manure/ha + complex fertilizer (22-22-0) 200 kg/ha.

The calcium sulphate amendment was applied in the fall of 2005; the manure was also applied in the fall and the complex fertilizer in the spring, in the early vegetation springing; irrigation was applied in June and July, with 200 m^3 water /ha each time. The production harvesting was made in the middle of July, and for each variant we took samples to determine the dry matter content.

The production results` statistic calculus was made with the variance analysis.

RESULTS AND DISCUSSIONS

Analyzing the mean values for the productions during 2006–2008, obtained as effect of amendments, fertilization and irrigation (tab. 1), we observe that the values were positive influenced. Without irrigation, we registered production increases of 26–167% for the variants without amendments, increases of 12 – 136% for the 3 t calcium sulphate/ha amendment and increases of 18–139% for 6 t calcium sulphate/ha amendment.

For the fertilization with manure (10 and 20 t/ha), also considering the amendments, the productions were of 1.13–1.30 t d.m./ha for the variants without amendment, of 1.20–1.40 t d.m./ha for the 3 t calcium sulphate/ha amendment and of 1.30–1.43 t d.m./ha for the 6 t calcium sulphate/ha amendment.

Fertilization with complex fertilizer conducted to productions of 1.37–1.53 t d.m./ha for the variants without amendment, of 1.63–1.70 t d.m./ha for the 3 t calcium sulphate/ha amendment and of 1.54–1.70 t d.m./ha for the 6 t calcium sulphate/ha amendment. Applying the manure together with the complex fertilizers lead to bigger productions: 1.67–2.40 t d.m./ ha for the variants without amendment, of 1.80–2.53 t d.m./ha for the 3 t calcium sulphate/ha amendment and of 1.82–2.63 t d.m./ha for the 6 t calcium sulphate/ha amendment.

Table 1

The influence of amendments, fertilization and irrigation on mean production values during 2006 – 2008 for a *Puccinellia distans ssp.limosa* grassland

Fertilization	Non amended				3 t $CaSO_4$ $2H_2O$/ha				6 t $CaSO_4$ $2H_2O$/ha			
	Non irrigated		Irrigated		Non irrigated		Irrigated		Non irrigated		Irrigated	
	Prod. t/ha	% signif.	Prod. t/ha	% signif.	Prod. t/ha	% signif.	Prod. t/ha	% signif.	Prod. t/ha	% signif.	Prod. t/ha	% signif.
Unfertilized control	0.90	100	1.30	100	1.07	100	1.43	100	1.10	100	1.50	100
10 t cattle manure/ha	1.13	126	1.53	118	1.20	112	1.64	115	1.30	118	1.73	115
20 t cattle manure/ha	1.30	144***	1.77	136**	1.40	131*	1.83	128*	1.43	130*	1.90	127*
Complex fertilizer (22-22-0) 100 kg/ha	1.37	152***	1.83	141**	1.63	152***	1.92	134**	1.54	140**	2.0	133**
Complex fertilizer (22-22-0) 200 kg/ha	1.53	170***	1.94	149***	1.70	159***	2.0	140**	1.70	155**	2.07	138**
10 t manure/ha + complex fertilizer (22-22-0) 100 kg/ha	1.67	186***	2.47	190***	1.80	168***	2.47	173***	1.82	165***	2.57	171***
10 t manure/ha + complex fertilizer (22-22-0) 200 kg/ha	1.83	203***	2.77	213***	1.97	184***	2.80	196***	2.10	191***	2.90	193***
20 t manure/ha+ complex fertilizer (22-22-0) 100 kg/ha	2.23	248***	2.92	225***	2.30	215***	2.90	203***	2.40	218***	3.13	209***
20 t manure/ha + complex fertilizer (22-22-0) 200 kg/ha	2.40	267***	3.04	234***	2.53	236***	3.33	233***	2.63	239***	3.40	227***

Non irrigated: DL 5% = 0.30 t/ha; DL 1% = 0.37 t/ha; DL 0.1% = 0.50 t/ha

Irrigated: DL 5% = 0.33 t/ha; DL 1% = 0.47 t/ha; DL 0.1% = 0.63 t/ha.

The production differences between the productions obtained as result of fertilization and of amendments are small, insignificant.

For the irrigated variants, productions were bigger, for the untreated as well as for the amended variants. For the untreated variants, the biggest productions were obtained for the application of manure + complex fertilizers (2.47–3.04 t d.m./ha), bigger with 0.94 t/ha than at the non irrigated variants.

The amendment with calcium sulphate and fertilization with complex fertilizer determined productions of 2.47–3.33 t/ha, respectively 2.57–3.40 t/ha, bigger with 0.67–0.97 t/ha, respectively 0.90–1.17 t/ha compared to the non irrigated variant.

CONCLUSIONS

1. The salt loving grasslands dominated by *Puccinellia distans*, spread on salty soils are interesting from the forage production's point of view;
2. The improvement of a *Puccinellia distans* grassland can be realized through amendments, fertilization with mineral and organic compounds and irrigation;
3. Without irrigation, the biggest productions were registered for the variants without amendments and fertilized with cattle manure and complex fertilizer (1.67–2.40 t d.m./ha;
4. For the irrigated variants, the productions were bigger for the same fertilization doses for the variants without amendments (2.47–3.04 t d.m./ha) as well as for the amended ones (2.47–3.33 t d.m./ha and 2.57 – 3.40 t d.m./ha).

REFERENCES

1. Cozma Cătălina, **2009** – *Reconstrucţia ecologică a pajiştilor permanente degradate de salinitatea solului din N-E silvostepei Moldovei.* Teză de doctorat;

2. Iacob t. and coworkers, 1996 – *Contribuţii la îmbunătăţirea pajiştilor halofile din Lunca Prutului*. Cercetări agronomice în Moldova, vol. 3-4;

3. Surăianu V., **1993** – *Tehnologiile culturilor furajere pe solurile sărăturate*. SCCASS Brăila.