ABSTRACT

Romania's permanent pasturelands and the integration into the European Union "... *as intelligent man would be, the routine or the simple agricultural observation cannot get him further than a certain perfection level of the known facts, but without science, it is impossible for him to cross new boundaries*"**.** An important component of the land patrimony of our country is the 4.8 million hectares surface of permanent pasturelands, rightfully considered a national treasure because it represents 20.4 % from our country's total surface and 32.9 % from the agricultural surface. This surface, if moderate cultivating technologies would be applied, could assure, annually, the food for at least 10 million UVM. Unfortunately, up to this moment, this economic indicator for appreciating the use value of the pasturelands is not accomplished, because of an improper legislation frame for these surfaces' exploitation, as well as because of the lack of interest towards the agricultural and ecological potential that these surfaces are offering. In the last few years, in the countries with an agricultural tradition from the European Union, the value of the pastoral fund is expressed by a multifunctional indicator, surrounded to the concept of sustainability. This new concept of the permanent pasturelands' multifunctional purpose includes their agronomical function (of production), as well as many important others, such as: using and preserving the specific flora and fauna's biodiversity, soil protection, the increase of the environment's quality (the landscape quality), the development of the agricultural ecological tourism. Through this new way of using the resources offered by the permanent pasturelands' vegetal carpet, man must respect and harmonize his interests respecting the laws of nature, because an uncontrolled technologies application and the abusive exploitation of the resources lead to irreversible damages in the relation soil – pastureland's vegetal carpet.

In our country's conditions, over 70 % from the permanent pasturelands' surfaces are placed on slopes, being continuously eroded. If the herbaceous vegetation would not cover these surfaces, true ecological catastrophes would take place, with incalculable economical and social effects.

Romania's permanent pasturelands still keep one of the most complex floristic biodiversity in Europe. This floristic structure includes numerous plant species with high pastoral value, which form the pasturelands' fodder production. Also, the Romanian pasturelands are

considered true natural gene banks, from which, through different improvement methods, new cultivars are created, formed by resistant breeds and hybrids. In the permanent pasturelands' vegetal carpet there are over 200 annual and multiannual leguminous species, with an important role in increasing the protein level of the fodder. In the same time, in our country's conditions, these leguminous species provide important quantities of biological nitrogen (between 30 and 150 kg/ha/year) through the symbiotic process of atmospheric nitrogen bonding.

A big part of the vegetal carpet flora in the permanent pasturelands it is still unused. Thus, it is important to make a floristic cartography for the medicinal and honey plants' ratio. The color spectrum and the morphological architecture of the permanent pasturelands' species improve the landscape quality of the vegetal carpet, with direct positive consequences on the ecological tourism's development in our country.

As result, the pastureland multifunction use system is based on the application of an integrated management of the vegetal carpet, through which the exploitation value of the pasturelands aquires a new dimension, linked to the sustainable system. In the same time, the multifunction use of the pastoral patrimony can stand for an appreciation standard of the Romanian agriculture's integration level into the European Union.

The researches concerning the salt loving permanent pasturelands are relatively numerous, but we consider that in the northeastern part of the Moldavian forest-steppe, these can be completed with new elements related to their improvement, by using different types of treatment and organic and mineral fertilization.

In order to elaborate this thesis we pursued the following objectives: the study of the salt loving vegetal associations from the northeastern part of the Romanian Plane, for determining the floristic structure and composition; the role of the different treatment types in improving the pasturelands placed on salty soils; the influence of the treatments and the organic and mineral fertilization on the production of the pasturelands dominated by *Puccinellia distans ssp. limosa*; the influence of treatment and fertilization on the vegetal carpet's structure for the pasturelands of *Puccinellia distans ssp. limosa*; the influence of treatment and fertilization on the nutritional and energy value of the obtained fodder.

In the first chapter we observed some aspects regarding the importance and spread of the permanent pasturelands and a characterization of our country's salt loving associations, meaning taxonomical classification, research centers where they are found and floristic composition.

In the second chapter we conducted a study on the salty soils, concerning their classification, spread and features. There are described the natural conditions that determined these soil's formation and the particularities regarding their improvement.

In chapter three we covered the actual stage of the researches, in our country and abroad, about salty soils and salt loving pasturelands.

Chapter four characterizes the natural frame from the northeastern part of the Moldavian forest-steppe, describing the morphology, the geology and rock layer structure, the hydrology and hydro-geology, climate and vegetation.

Chapter five contains the objectives, the used material and the research method.

In chapter six seven we identify and describe eight salt loving associations (As. *Salicornietum prostratae*, As. *Puccinellion limosae*, As. *Staticeto-Artemisietum santonicae*, As. *Iridetum halophilae*, As. *Camphorosmetum annuae*, As. *Obionetum verruciferae*, As. *Juncetum gerardi*, As. *Beckmannia eruciformis*) placed on salty soils in the northeastern part of the Moldavian forest-steppe, in Iaşi and Botoşani counties. For each association we determined the cover degree, the floristic structure and composition, the biological form and the plant-geographical element.

Chapter seven eight contains the largest part of the thesis, concerning the influence of treatments and fertilization on the pastureland of *Puccinellia distans* ssp. *limosa*. Therefore, in 2005 we organized a two-factor experiment of 3x3x14 type on a salty, gleic, pelic soil in Bahlui meadow (Leţcani-Iaşi). There are described the area's natural conditions, soil profile and climate conditions. The researches in this period (2005-2008) pursued the influence of treatments and fertilization on production, on vegetal carpet's biodiversity, on fodder's nutritional and energy value and on some agricultural chemical indicators of the soil.

As result of the researches during 2006-2008, we acknowledged that the treatment with calcium sulphate 6 t/ha and charcoal powder 10 t/ha for a pastureland of *Puccinellia distans* ssp. *limosa* influenced the dry matter production; production increases of 8-20 % were registered compared to the untreated surfaces.

The fertilization with organic and mineral compounds had a favorable effect on production. The biggest productions were obtained for the fertilization with manure 10-30 t/ha combined with $N_{64\text{-}96}P_{32}$ (3,0-3,8 t/ha DM).

Fertilization combined with treatment and fertilization with manure emphasized that there were registered significant differences in what regards the production in all three experimental years.

In 2006 we obtained bigger productions for the treated surfaces, compared to the untreated vaiants, for all levels of fertilization, as follows: for charcoal powder 2,5-3,7 t/ha DM, for calcium sulphate 2,1-3,4 t/ha DM compared to 1,9-3,2 t/ha DM for the untreated variant.

In 2007, because of the unfavorable climate conditions, the productions were smaller compared to the previous year's ones. This year's biggest productions were registered manure 20-30 t/ha+$N_{64-96}P_{32}$ fertilization (2,9-3,2 t/ha DM for charcoal powder variant, 2,8-3,0 t/ha DM for calcium sulphate compared to 2,4-2,6 t/ha DM for the untreated variant).

The year 2008, normal in what regards the rainfall quantities, favourized the harvesting of two production cycles, their level being with 30-50 % bigger compared to the last years' productions. The biggest productions were obtained for fertilization with manure 20-30 t/ha+$N_{64-96}P_{32}$ (5,5 t/ha DM for charcoal powder variant, 4,6-5,2 t/ha DM for calcium sulphate variant and 3,9-4,7 t/ha DM for the untreated variant).

The average production values during 2006-2008, emphasize that treatments and fertilization lead to big productions (2,4-4,1 t/ha DM for charcoal powder variant, 2,1-3,9 t/ha DM for calcium sulphate variant compared to 1,9-3,5 t/ha DM for the untreated variant).

The treatments and the fertilization variants influenced the biodiversity for the pastureland of *Puccinellia distans* ssp. *limosa*.

In 2006, for the untreated surfaces, the ratio of the graminee species was of 56-79 %, bigger than for the fertilization variants using mineral compounds and in 2008, their ratio was of 64-79%, with a bigger participation for the fertilization variant using manure 10 t/ha+$N_{64-96}P_{32}$ and for the fertilization variant using only mineral compounds.

For the variants treated with calcium sulphate, the ratio of the graminee species was of 57-81 % in 2006 and of 58-80 % in 2008, registering a decrease with 1-2 % in favor of the leguminous species. For the variants treated with charcoal powder, the graminee's participation was bigger 55 – 82 % in 2006 and 58 – 82 % in 2008, registering a decrease of the leguminous species with 1-2 %.

The plants' raw protein content was insignificantly influenced by treatments and fertilization.

In 2006, for the untreated surfaces, the raw protein content was of 6,85-11,05 g/100g DM, for calcium sulphate variants was of 7,37-11,23 g/100g DM and for charcoal powder variants was of 7,25-11,48 g/100g SU. The biggest raw protein content was registered for the lignit poeder variants, fertilized with 30 t/ha manure+ $N_{64-96}P_{32}$ (11,48 g/100g DM).

The raw cellulose content was smaller for the charcoal powder variants, when fertilized with 20-30 t/ha manure + $N_{64-96}P_{32}$ (21,35-22,26 g/100g DM, compared to 21,75-22,95 g/100g DM for the calcium sulphate variants and 22,10-23,26 26 g/100g DM for the untreated variants).

In 2008, for the untreated surfaces, the raw protein content was of 6,35-11,10 g/100g DM, for calcium sulphate variants was of 7,60-11,20 g/100g DM and for charcoal powder variants was of 7,80-11,40 g/100g DM. The biggest raw protein content was registered for the

charcoal powder variants, fertilized with 30 t/ha manure + $N_{96}P_{32}$ (11,40 g/100g DM). The raw cellulose content varied slightly related to the treatment type and fertilization.

The conclusions and recommendations emphasize the theoretical and practical value of improving the *Puccinellia distans* ssp. *limosa* pasturelands by using treatments and organic and mineral fertilization.

Chapter eight includes the influence of the experimental factors on some economical efficiency indicators (total costs, production cost, net income and the efficiency rate). Analyzing the economical efficiency indicators for the untreated surfaces and for the treated ones, we conclude that the biggest income values were obtained for the surfaces treated with calcium sulphate and for the untreated ones, even if the variants treated with charcoal powder registered bigger production values.