

ABSTRACT

The habilitation thesis is structured in accordance with the applicable laws and regulations of USAMV on the organization of the process of obtaining the certificate of entitlement to acquire quality of doctoral supervisor.

At the beginning of habilitation thesis I presented a summary both in Romanian and English, after which I presented scientific and professional achievements, plans and career development. This part is divided, on its own, into three sections. In the first part I presented scientific, professional and academic achievements, on disciplinary or interdisciplinary thematic directions. In the second section, I have presented development plans and future professional, scientific and academic career development or research / teaching / practical applications directions and probable modes of action to implement them. In the third section I presented some references in the content of the first two sections.

In the first section, we present the most important results, divided into three lines of research:

- ***the influence of management on permanent grassland;***
- ***the influence of management on sown grasslands;***
- ***the influence of management on annual forage plants.***

The achievements are documented by references to publications, patents or other embodiments disclosed, each reference enabling verification. At the same time, personal achievements are presented in the context of the current state of scientific research in the thematic area of specialty, internationally or nationally for research areas with national specificity, emphasizing, with reasons and documented, the relevance and originality of the personal contributions.

The first line of research concerns the most important results regarding the influence of management on permanent grassland.

Thus, an important point is the results on the influence of fertilization on *Festuca valesiaca* grasslands. In this sense, I presented the results obtained from the experiences carried out in 1998-2009. *Festuca valesiaca* L. grasslands are spread across the steppe of southeastern Romania and the steppe in northeastern Moldavia, on hillsides with steep slopes up to an altitude of 600-800 m. These meadows are less productive, yielding productions of 3-5 t / ha green mass and are used mostly by grazing.

The average yields for the period 1998-2009, on the permanent grassland of *Festuca valesiaca* L. were influenced by climatic conditions, dosages and combinations of chemical and organic fertilizers applied. Fertilization contributed to improving the botanical structure and raising the percentage of grasses at the expense of leguminous plants. The management used, characterized in time by low inputs and stability, has contributed to a relatively high yields and biodiversity conservation on *Festuca valesiaca* L. grasslands. Using low input based management is a viable leading to obtain high yields and contributing to biodiversity conservation.

Important results were obtained regarding the permanent grassland management in a project titled "Research on food and agronomic value of major grassland ecosystems in Romania, in terms of maintaining biodiversity and sustainable management of vegetation cover." In this project we aimed to determine the food and agronomic value of some types of meadows within experimental fields, located in different regions of Romania, representative in terms of pastoral purpose and establishing the influence of technological inputs on productivity, quality and biodiversity of vegetation cover.

For this, we evaluated the main types of grasslands in the forest steppe area, in the following locations: Moara Domneasca, Beba Veche-Timiș, Ezăreni-Iasi, Grădinari-Caraș-Severin, nemoral zone, Preajba-Gorj, nemoral zone, Vârciorova- Caraș-Severin, Măgurele-Brașov, Căteasca-Argeș, Campulung Moldovenesc, Lisa-Brașov and from the boreal floor, the locations Vatra Dornei, Brebu Nou - Caraș-Severin, Gârda – Ghețari-Alba, Păltiniș-Sibiu, Rânca-Gorj.

In the second direction of research I presented the most important results regarding the influence of management on sown grasslands.

Temporary grasslands give much higher yields than permanent grassland, but maintaining their productive potential at the highest level is achieved by applying fertilizers, especially nitrogen based. Important results were achieved under the grant, undertaken in 2001-2002, financed by the World Bank, entitled "Research on the improvement of fertility and reduce soil erosion on sloping land in the Moldovian steppe, a prerequisite for sustainable agriculture". In this project we have established the contribution of some practical work factors to the improvement of soil fertility, reducing damage caused by erosion, increasing productivity and forage quality. The studies were needed to determine the most appropriate ways to use the land slopes, consistent with current distribution to holders of the land, as well as specific technologies.

Some papers refers at the influence of using perennial grasses mixtures and organo-mineral fertilization on biomass production of temporary

grassland in the Moldavian steppe, located on sloping ground, on forage quality, vegetation structure and soil characteristics. In this respect, were experienced various doses and combinations of mineral and organic fertilizers in order to establish the optimal fertilization on such meadows, and to reintroduce organic fertilizers in the fertilization circuit of grassland systems.

Forage yields were influenced by the type of mixture of perennial grasses, the doses and combinations of organic and mineral fertilizers and pedo-climatic conditions.

The fact that the production of the feed was higher in all levels of the fertilizer at both mixtures, compared to the control - the unfertilized plot, shows the usefulness of the application of organic fertilizers, mineral or organo-mineral fertilizers on the grassland. Application of organic and especially the mineral fertilizers causes significant changes in the structure of grassland vegetation and root mass formation in the soil. Increasing doses of nitrogen fertilizer applied alone or together with organic fertilizers, produces an increase of participation of grasses while the share of leguminous herbs decreases. Root mass increased with the increase of the dose of fertilizer applied, following the same trend of above ground biomass dynamics.

In the third line of research I presented the most important results regarding the influence of management on annual forage plants (*Zea mays*, *Sorghum bicolor*, *Sorghum sudanense*).

Important results were achieved in the grant entitled "Research on valuing the biological potential of sorghum and Sudan grass, in order to improve the structure and quality of fodder base in Central Moldavian Plateau, in which we observed the role of the two species in providing fodder base, fluently and constant, even during the unfavorable years, in conditions of the Central Moldavian Plateau. We also observed the contribution fertilization had on increasing the productivity of sorghum and Sudan grass, allowing profitability for individual farms or associations owning or operating such cultures. The researches that were carried out in 2006-2008 will contribute to the rehabilitation of sorghum and Sudan grass cultures, in conditions similar to those in the north eastern Romania. To conduct observations, interpretation and specific analyzes there were performed cropping on production cycles and experimental variants, in order to determine accurately the dry matter production achieved.

The interaction between species, fertilization and harvesting mode highlights the fact that the average yields obtained on sorghum harvested for green were higher compared to Sudan grass.

In the last section I presented some references in the content of the first two sections.