
MODEL OF PASTURE RECOVERING BY GROWING SMALL RUMINANTS IN MOUNTAINOUS REGIONS

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ABSTRACT

Large grazing areas extend in mountainous, mostly south-east parts of Federal Republic of Yugoslavia. Unfortunately, only 20% of these satisfies all necessary demands for growing sheep and goats, such as relief, physical, chemical and biological characteristics of the soil, botanical composition of pasture, watering, climate conditions and epidemiological situation; next 40% are insufficient in one, and rest 40% are insufficient in more than one of demands. Many of these grazing areas are not in use which is caused by population migrations to urban centers and, consequently significant decline in number of grazing animals, winds, floods causing erosions, etc. Consequently, they revealed dynamic balance disturbance and sudden botanical decomposition, often towards prevalence of useless and toxic species, bushes, and low trees. This was caused not only by global climate changes and soil erosions, but humane and animals depopulation, specially small native ruminants, sheep and goats.

Key words: pasture recovering, grazing areas, erosions, model

INTRODUCTION

Pasture sources of FRY have great importance to country economic development, and basically the only support to rural economy development of mountainous regions, but not in proper use. There is no serious alternative in livestock production development in mountainous regions, which makes 63% of territories of FRY, to "low input" models based on biological self-preserving pasture exploitation by sheep and goats and supported and followed by other forms of sustainable and organic agriculture, considering depopulation and shortage of financial sources.

In respect of facts that these regions had slow economical development but relatively preserved natural resources, species bio-diversity, and traditional livestock rising, orientation of manufacturing high quality products with autochthonous and protected

geographic origin – meat, milk and further products could be justified. High quality food production is the only way that agricultural production makes environmental preservation possible, improving economic and social conditions of inhabitants as well. Specific flavor and scent of autochthonous livestock products madden in these traditional regions could be preserved and upgraded by ecological supported exploitation and revitalization of deserted grazing areas.

BASICS OF PROGRAM

This program should have include economical evaluation followed by short- and long-termed plans of recovery of the lawns as main food resource for sheep and goats production. Program should be based on exploitation of autochthonous breeds of sheep and goats, accommodated to local relief and climate conditions.

Serious application this program measures in undeveloped mountainous parts of Serbia, such as Stara planina, Vlasina, Pešter, etc., should gradually integrate these regions to economy of the country and Europe, offering products of outstanding quality. That will provide employment in agriculture, food processing industry, humane and animal health services and other activities (like tourism, constructions, etc.) upgrading local infrastructure, organization and capacities respectively, preventing further migrations towards urbane centers, increasing incomes not only in these undeveloped areas, but whole country.

Other forms of sustainable and organic agriculture should be developed and introduced, elevating ecological awareness changing nutrition habits of the people, preventing further social and cultural degradation. Permanent education of farmers and developing needs to upgrade their knowledge about production, breeding, animal health and general hygiene should take place.

It should be emphasized that these activities do not affect development of conventional livestock in Serbia.

In FRY are mostly grown, basically in extensive manner, combined producing breeds of sheep and goats (different breeds of pramenka, e.g.), Melioration should take place, using superior animals, improving production performances of domestic breeds, but preserving their good health.

According to this model, pasture season should last depending as long as weather conditions allow and grass height of 20-25 cm, starting on April, 20th to May, 12th, nearby the villages at first. During season, rotating and semi-planed grazing, considering natural barriers, should be applied, using electric or stabile fence, or by shepherd. Related to lawn productivity, planed grazing dynamic, size of pasture, and number of sheep and goats per 1 ha should be corrected. Grazing of 10 animals per ha of rotate pasture, with average body weight of 50 kg, should last 5-7 days. Sheep and goats, taking food in different manners, should be kept together in ratio 3:1 to 4:1. Lawn regeneration period should last 18 - 22 days during spring, 25 – 30 during summer, and 35-45 days during fall.

Basic topic of this program should be make acceptable and economically justified model for revival and re-cultivation of deserted and low-productive lawns in mountainous regions. Controlled exploitation of the lawns would contribute to the gradual re-cultivation, growth of desirable grass species and reduction of weeds, especially bushes. In many countries with large grazing areas are in use systems like these, so-called “low-input” agriculture systems, where number of growing animals could be fast increased by foreign developing investments. This model should benefit not only rational use natural resources and

environment preservation, but stimulation of long-termed production of meat, milk and wool as well, engaging relative low investments. Finally, this model should upgrade lawns of low to medium nutritive value gradually with contemporary biodiversity preservation. This model should be applied to grazing areas that are not predicted in full preservation program in National park Stara planina, chosen by Department of nature protection and Department of agriculture.

Following investigations should be performed in order to apply the model of pasture recovering in mountainous regions: macro- and microelements levels in soil and plants, botanical composition and dynamic of the lawn, pasture quality and revival, exploitation systems, nutrition, animal production and reproduction results and animals and pasture hygiene.

1. Macro- and microelements levels in soil and plants

Starting macro- and microelements levels should be investigated in soil and plants relevant to animal nutrition (N, P, K, Ca, Mg, Na, Zn, Mn, Cu, Co, F, Se). Lawn soil fertility should be estimated by pH, humus, CaCO₃, status of adsorptive complex, mobile Al, and presence of certain heavy metals: Pb, Cr, Ni, Zn, Cu, Co, Mn, Cd and Al. Considering these, low intensity reparing measures would be taken, like addition of small doses of NPK fertilizers, partial neutralisation to acid soils, and, if it is necessary, addition of some microelements (Zn, Cu and Co). Grazing areas with too high heavy metals levels, especially in plants should be excluded. (14., 12., 13.)

Levels of macro- and microelements in soil and plants should be examined during pasture exploitation period, in respect to applied system of exploitation. Microelements level should be analyzed in certain plant species which are especially interesting, considering general quality of forage and consequently animal health. Microelements level should be also investigated in final products intended to human nutrition (10., 8.).

2. Botanical composition and dynamic of the lawn

Phytocenosis composition changes should be observed in the beginning and during investigation, which is necessary to control development dynamics of certain plant species, important to animal's productivity, especially medical plants influencing digestion and metabolism. Investigations could provide registration and control of intake of certain species, establishing innovating evaluation plant's system and prediction ratio changes of certain plants, participation in biomasse gain, especially toxic and useless species. Influence of different grazing systems and animal specie to botanical composition produced biomasse and its used/wasted parts. Interspecies' concurrence would be monitored as eco-physiological measurements of chosen species. Outnumber of plant species should be monitored, as well as preservation of bio-diversity during lawn revival, especially preservation relict, endemic and medical plant species. (5.)

3. Pasture quality and revival, exploitation systems, nutrition and animal production results

Low intensity reparation measures of grazing areas should be applied regionally, considering needs based on natural and economic parameters (height above sea level,

geological composition of the soil, lawn quality, profitability of lawn reparation, epidemiological situation, especially contagious foot-rot). (2.)

Basic quality parameters of produced biomasse and dominant species, raw protein content, acid detergent fiber (ADF), neutral detergent fiber (NDF), ash composition, should be monitored, in order to establish lawn quality changes during period of revival, also productivity changes in system of rotate and semi-planed only sheep/goats or combined grazing, usage of NP(K) or micro-fertilizers. Addition of leguminous species in more intensive pasture exploiting region should be applied, as basic measure of "low-input" repairing system of the lawns. According to previous, animals nutrition quality should be established and proposed additional nutrition systems in order to increase and improve production and reproduction performances of animals (5.). Effects of applied lawn repairing measures should be estimated through these animal performances. (4.)

Production results should include following:

- gain and meat quality (fattening characteristics and abattoir performances, chemical composition and basic technological characteristics),
- gain and quality of milk and milk products (physical and chemical characteristics and bacteriological status),
- gain and quality of wool (4.).

Considering plant analysis and certain medical and aromatic plants consumed by animals should be estimated general behalf to animal productivity.

Economical aspects of low input production in lawn recovery system should be represented by method of approximation.

4. Animals and pasture hygiene

Hygiene measures to the lawn and to animal's husbandry application, developing stadiums of parasites presence in animals and lawns (1., 9., 7., 11.) should be investigated, as well as reproductive results, especially in respect of reproductive diseases, artificial insemination and animal hygiene (11.).

Appearance of metabolic and locomotor system diseases related to pasture exploitation, especially contagious foot-rot, should be investigated (2., 3.). Examination of metabolic disorders should be performed, based on established metabolic profile (proteins, glucose, Ca and P levels in blood sera of sheep and goats).

CONCLUSIONS

In the past 50 years many hectares of former pastures in Serbian mountainous regions where overgrown by wild vegetation, mostly with bushes and small trees. One of the reasons for uncontrolled growth of wild species was a sharp decline in number of small ruminants that took place during this period. Today, by densely growing small trees and bushes therefore, the balance between agricultural and forest land is lost. The main goal of our project is to revitalize and recultivate pastures in mountainous regions by introducing a combined farming system, which includes the elements of agriculture, animal husbandry and forestry - a so called silvopastoral system. By controlled grazing of small ruminants, which serve as a tool for land cultivation, we can control natural vegetation, clean the land,

already overgrown by woody species and improve the quality of the turf. Beside land cleaning and cultivation, the system enables the production of meat, milk and wool.

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