

Marijana Jovanović, B.Sc.

Slavica Arsić, MSc

Institute of Agricultural Economics, Belgrade

Savo Vučković, Ph.D.

University of Belgrade, Faculty of Agriculture, Belgrade

ECONOMIC JUSTIFICATION FOR USE THE GREEN FORAGE CONVEYOR IN PRODUCTION¹

Abstract

Modernizing of livestock production, it is necessary to create a quality base for production of quality green forage. In terms dictated by climatic conditions and market trends, it is necessary to switch to a different way to make enough food to feed farm animals. Accordingly, the use of green forage conveyor, shown many advantages over the traditional way of meadow-pasture utilization system of forage. In agronomic terms, stimulates fuller utilization of nutrients in fresh form, in economic terms reducing costs the processing and storage, as well as the use of machinery in the production process. The use of this method is the most cost effective way to create economic production and conservation of plant genetic resources.

Key words: *green forage conveyor, modern livestock production, economical production*

JEL Classification: Q10

ЕКОНОМСКА ОПРАВДАНОСТ УПОТРЕБЕ ЗЕЛЕНОГ КРМНОГ КОНВЕЈЕРА У ПРОИЗВОДЊИ

Апстракт

Осавремењавањем сточарске производње, неопходно је створити квалитетну базу за продукцију квалитетне зелене крме. У условима које диктирају климатски услови и тржишне тенденције, неопходно је прећи на другачији начин стварања довољних количина хране за прехрану домаћих животиња. Сходно томе, употреба зеленог крмног конвејера, исказује бројне предности у односу на класични начин пашино-ливадског система искористићавањем кабасте сточне хране. У агрономском смислу, постепује се потпуније коришћење хранљивих материја у свежем облику, док у економском смислу појефтиније процес прераде и чувања, као и употребе механизације

¹ The paper is part of research on the project III 46006: "Sustainable agriculture and rural development in function of achievement strategic goals of Republic Serbia in the Danube region" and as part of project TR 31016 "Improvement of production technology and cultivation of fodder crops on arable land and grassland", which financed by Ministry of Education, Science and Technological development of Republic Serbia.

у процесу производње. Употреба оваквог начина је најрационалнији начин за стварање економичније производње и очувања биљних ресурса.

Кључне речи: *зелени крмни конвејер, савремено сточарство, економичност производње.*

Introduction

Modern and developed livestock are based on quality and rational production of quality forage in long period during one year. Possibilities for production and nutrition of domestic animals is first of all determined with species and cultivars of forage crops which can be used, and which has the following characteristics:

- high yield,
- good quality,
- short vegetation,
- high power of regeneration
- possibilities of using different edaphic – climatic conditions,
- growing in several deadlines throughout the year
- possibilities of procurement of seed at affordable prices.

In practice is not always possible to find all wanted characteristics in one plant species, and for this reason approach is to combined organization of plant production, i.e. combining two or more cultures which have the desired traits.

The question arises in what way to provide a stable base for the development of livestock production, which in the last decade saw a fall in total production, due to the devastation of permanently low subsidies in this activity. Climatic trend in recent years causes a drought in all regions due to the high temperatures and reduced rainfall, leading to extreme price increases of raw materials, which affects the growth rate of the concentrated feed, which then raises the price of the price of basic foodstuffs.

For this reason, in the developed countries, as a means of overcoming the crisis problems cited as desirable, the introduction of *green conveyor* in crop production. In this way, the choice of range forage crops and their varieties, their organization and the proper combination of sowing to the continuous arrival of food (green forage conveyor), forage production, and therefore feeding green fodder can be extended, even on the winter, and thus cheaper to make livestock production

Green forage conveyor system is a continuous (continuous) production of forage for livestock feed, to produce in the long run. Green fodder production is a specific form of roughage (organic matter) through the utilization of forage plants at the stage of technological maturity, and that your circle is closed by the exploitation of the animal nutrition into essential for human food (meat, milk, eggs, wool, etc..). Our country is so far-selected, as it is known, a number of different varieties of forage and other crops (cabbage canola, corn, soybeans, millet, etc..) Used for forage production, high yield and excellent quality. They provide the full sequence of anthesis conveyor. That is why we are able, by his own varieties, which is a comparative advantage of the country, to organize the production of forage for green fodder conveyor system. Of course, just to be irrigated forage production throughout the growing season.

Materials and methods

The objective of this paper is the presentation of the reasons why it should be wider representation of green conveyor in practice, as a way of organizing production plant. One of the conclusions of the work should show this kind of business as a way to get the economic situation in agriculture may affect the use of cheaper feed as the main raw material for further processing.

Results and Discussion

Green fodder has an effective impact on the digestive system, because consuming of fresh food the livestock utilize sufficient amount of carbohydrates, fats, oils, vitamins and other substances for their development. Also due to the reduction of certain costs (canning, preserving in losses) makes those food costs as low as possible. In this way, direct impact on reducing variable costs involved in the overall costs of around 60% and thus make to production to be as profitable as possible. At the same time the percentage of utilization than other types of food (hay, silage, etc..). Dietary green fodder, milk production increases, and the use of concentrate can be reduced by 16%.

Today there are three types of green conveyor as follows:

- natural grassland (meadow-land),
- culturally cultivated soil (limited),
- combined conveyor.

Cultural conveyor cultivated soil is most suitable for food because it can be planned that by time, and by the percentage of forage, while at the same time provides better utilization of arable land, Soil and proper crop rotation.

Planning a green conveyor requires intensive production method which implies agglomeration, irrigation system and a plan for decades and months feeding livestock.

When we talk about plants that can be grown in the green conveyor differentiate six groups. The **first group** includes: winter crucifers: cabbage canola, Turnip rape, Borecole, Collard greens, etc. The **second group** includes: winter annual forage legumes: *Pisum sativum*, *Vicia sativa*, *Vicia panonica*, *Vicia villosa*. The **third group** includes : spring annual forage legumes (early sowing, and the same in the mixture): cabbage canola, *Vicia sativa*, broad bean (*Vicia faba*) , Lupins (*Lupinus sp.*). Also in this group includes: spring cabbage (early sowing) forage kale (broadleaves).The **forth group** includes: forage species gajive several deadlines throughout the year: forage kale, forage mallow, Alexandrian clover, etc. In the **fifth group** is included: one year species of cereals: forage corn, forage millet, sudan grass, etc. The **sixth group** includes: one year forage legumes (late sowing, and the same mixture): soyebean, viona, white lupines and etc.

In preparing the baselines, particular attention was paid to:

- possibilities of using some cultures even during the winter (forage kale),
- the nutrition value and digestibility of forage crops some plant species,
- the length period of use without significant decreases of quality,
- and of the consumption of green forage of the different forage plan species.

We recall that it is greater in the premises, on less pasture, and the best in the younger stages of plant growth.

In Table 1., will be show the basic characteristics of plant species which can be part of green conveyor, the time of their sowing, and also the time of their maturities for use.

Table 1. Green food from arable land, time of use and yields

Species	Time of sowing	Time of use	Yield, t/ha	Duration of use, days
Winter rapeseed	End of July	Middle of April	20	15
Winter rapeseed + winter rye	Beginning of September	Beginning of May	30	15
Winter rapeseed + forage kale	End of September	Middle of May	30	15
Spring oats + vetch + forage pea	Beginning of March	Beginning of June	32	15
Forage corn	End of April	Beginning of July	31	15
Sudans grass	Middle of May	Middle of July and August	31	15
Forage corn (after oil rapeseed)	Beginning of May	Middle of August	31	20
Forage corn (after oats with forage pea)	Beginning of June	Middle of September, October and November	31	30
Forage kale	Beginning of July	Middle of November	22	15
Alfalfa	Beginning of September	May, June, July	20	40

Source: Author's calculation, 2012.

Based on obtained data, can be concluded that with organizing of production the green forage by green forage conveyor, is been achieved that on field comes to change of qualitative species, which provides production of qualitative forage since April, in some areas until November.

Plant species which goes into structure of green forage conveyor characterized by intensive production of biomass, where the biggest amounts can be obtained by combining spring oats, vetch and forage kale (32 t/ha), and lowest amount of green forage obtained by growing the winter rapeseed or alfalfa in monoculture. Optimal period of use this cultures is different, and ranges from 15 days until 40 days (alfalfa), reducing the proportion of high-quality components in the green cabin.

In this way it can be achieved for long term utilization of green biomass, a reduction in costs involved in processing when a crop is harvested, and in its place must come the second crop. It can also be achieved by a significant reduction in the costs incurred in processing and storage of biomass obtained. Plant species included in applications have green conveyor characterized by a high percentage of dry weight, sufficient amounts of protein and energy. Use of forage can be obtained to provide a sufficient number of properly-balanced meals to eat.

Conclusion

Green conveyor organization, an increase in forage production on their own farms, induced reduction of costs proper organization of work, reducing nutrient losses during preparation. Is no room left for the introduction of new, advanced technologies and introduction into production of new and more profitable crops.

Using forage plants from the six groups of growth, creates the optimum areal coverage of arable land and nutritious crops, which can alternately provide sufficient amounts of biomass in the period from mid-April when the cattle grazing plays in high mountain regions, and even to November, when the cattle in lowland regions close to the stables.

Imposes itself question why green forage conveyor, despite a number of advantages, not the few, represented in domestic production practice. The answer to this question should be sought in the following: introduced several kinds of forage plants, which significantly complicates the production of plants, green forage conveyor needs a good organization, technical equipment, great dynamics and seamless operational and technological discipline. Adding to this the fact that the work of the Serbian society sufficiently stimulated, the shortage of staff, especially in forage production, it is clear why, even for modest estates, avoids the organization of production of forage for green fodder conveyor system. Added to this, a negative opinion of nutritionists, that the frequent changes in types of nutrients causes certain changes in the physiology of digestion of domestic animals, which are ultimately reflected in the next 1-2 days, the slight drop in milk production and daily gain. In doing so, forget it, just how central hinterland use of forage, when it comes to the medical service of livestock and how antibiotics are consumed to maintain it.

References

1. Саво Вучковић (1999). Крмно биље, Пољопривредни факултет Београд.
2. Министарство пољопривреде, шумарства, водопривреде Републике Србије (2009). Пољопривредни билтен, Пољопривредна стрична служба Врање.
3. De Visser, H.: Characterization of carbohydrates in concentrates for dairy cows. Recent advances in animal nutrition, pp. 19-38, Nottingham University Press, Nottingham, 1993.
4. Horrocks, R.D., Vallentine, J.F.: Harvested Forages, Academic Press, San Diego, 426 pp., 1999.
5. 10. Johnson, L., Harrison, J.H., Hunt, C., Sinners, K., Dogget, C.G., Sapienza, D.: Nutritive value of corn silage as affected by maturity and mechanical processing a contemporary review. Journal of Dairy Science (82), 2813– 2825, 1999.